NETWORK WORLD

The Newsweekly of User Networking Strategies

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First CNO II user seeking service edge

By Anita Taff
Washington Bureau Chief

CHICAGO — Boise Cascade Office Products Corp., one of the nation's largest distributors of office supplies, has become the first user of AT&T's Custom Network Offering (CNO) II.

With CNO II, announced in March, AT&T helps users design data networks, coordinates provisioning of hardware and services, and aids in network administration. In its contract with Boise Cascade, AT&T has also agreed to house the necessary network equipment.

The office supply company will use the service to upgrade an order entry network it has relied on for years as a strategic marketing tool.

"We distinguish ourselves with our service and our systems," said Jim Harder, manager of information systems at Boise. "That's our value."

The company guarantees that customer orders will be delivered by 8 a.m. the next day, meaning Boise typically has less than 24 hours to process orders, create invoices and notify distribution centers to deliver goods.

To entice business and facilitate order taking, Boise built a network that enables its largest

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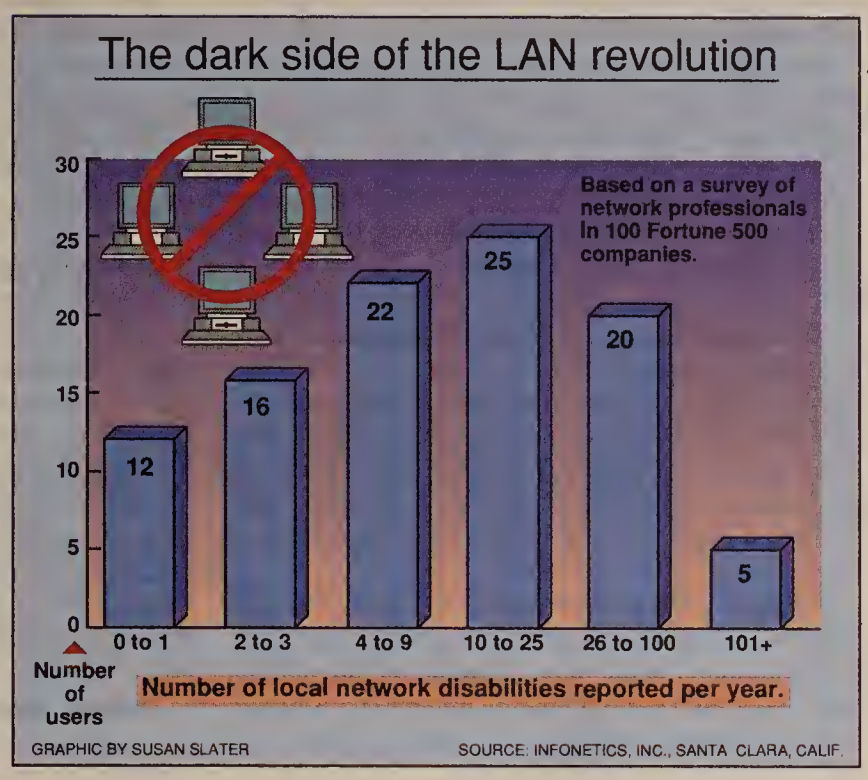

Local net downtime costs users millions, study says

Survey weighs impact on productivity, revenue; says most users spend too little on maintenance.

By Laura DiDio
Senior Editor

DALLAS — Local network downtime costs companies an average of $3.5 million in lost productivity and more than $600,000 in lost revenue annually, according to a survey of Fortune 500 users to be released at NetWorld '89 here this week.

Despite such losses and users' increasing reliance on local networks, the survey shows that companies spend relatively little — an average of $60,000 annually — on local net maintenance.

"Clearly, users aren't paying enough attention to the care and maintenance of their networks compared with what [problems are] costing them in lost productivity and revenue," said Steven Spanier, vice-president of Infonetics, Inc., the Santa Clara, Calif.-based consulting firm that prepared the report.

Spanier said local nets are becoming as vital a business tool as telephones. "If the LAN goes

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IBM boosts AS/400's network capabilities

TCP/IP support widens mini's role in multivendor nets, firm offers first Token-Ring/Ethernet bridge.

By Paul Desmond
Senior Writer

NEW YORK — IBM last week extended the network reach of its Application System/400 minicomputer by adding support for TCP/IP, complemented by a new Token-Ring-to-Ethernet bridge.

Support for Transmission Control Protocol/Internet Protocol will enable AS/400 users to exchange files, data and electronic mail with other processors that support TCP/IP, including Unix-based workstations from vendors such as Sun Microsystems, Inc. and Apollo Computer, Inc.

Personal computers and other devices attached to an AS/400 via an IBM Token-Ring Network can use TCP/IP and the new IBM 8209 LAN Bridge to communicate with non-IBM processors on remote Ethernets.

IBM also enhanced its 3174 controllers to ease network management and provide new options for linking terminals, personal computers and other devices to mainframes (see "IBM enhances 3174, adds host connectivity options," page 4).

IBM also broadened the AS/400's private branch exchange connectivity to the IBM 9751 CBX family and introduced new ASCII workstation controllers for the AS/400 line.

IBM made the connectivity announcements at a briefing here to introduce two new models of the AS/400.

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INSIDE

Alligators in the swamp
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Bank group gives AT&T the business

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — The Corporation for American Banking (CAB), a subsidiary of the American Bankers Association (ABA), signed a bulk purchasing agreement with AT&T here last week that will save its members about 15% on the cost of long-distance service.

A new consortium, American Bankers Access, will act as a sales agent for AT&T, purchasing services and reselling them to individual banks. The agreement covers almost all of AT&T's switched and private-line voice and data services.

The consortium, formed by CAB and Financial Communications Exchange, Inc., a consulting company in Cleveland, is the first national marketing agent for AT&T's long-distance services, said Donald Ogilvie, executive vice-president of the ABA.

The consortium also announced purchasing agreements

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NETLINE

GM GIVES A BOOST to MAP 3.0, saying it plans to use the factory network system in its new Saturn facilities. Page 2.

MERRILL LYNCH PLANS to hand over net management to MCI and IBM. Page 2.

TWO MORE USERS sign up for Tariff 12 deals. Page 4.

EDI INVESTMENTS pay off big for U.S. companies. Page 6.

DCA EYES SPINOFF or sale of its wide-area network group to bolster stock value. Page 8.

PHOENIX HOSPITAL, IBM join forces to explore voice/data applications for the health care industry. Page 8.

HOW VULNERABLE is the public switched network? Page 51.

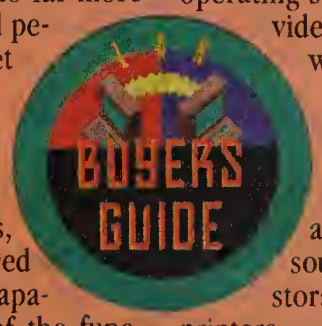
NEWSPAPER

FEATURE

LAN operating systems come into their own

By Steve Guengerich
Special to Network World

Today's local network operating systems enable personal computer users to do far more than share data and peripherals. Local net operating systems today have powers that extend a user's reach across wide geographic areas, providing enhanced communications capabilities and many of the functions traditionally offered by operating systems that run on minicomputers and mainframes.



Although they use different system software, all local net operating systems tend to provide the same basic network functions, including multiuser application support, security, network management and sharing of resources such as disk storage subsystems and printers.

However, it is the way in

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GM commits to MAP 3.0 for new Saturn car facility

Automaker to install broadband MAP nets with up to 250 nodes each at three main Saturn plants.

By Susan Breidenbach
West Coast Bureau Chief

TORONTO — General Motors Corp. last week said it plans to use MAP 3.0 as the foundation of factory network systems at its new Saturn Corp. car manufacturing subsidiary.

Mike Kaminski, manager of computer-integrated manufacturing (CIM) networking for GM's advanced engineering staff, told the North American MAP/TOP Users Group at a meeting here last week that Saturn will be the continent's largest Manufacturing Automation Protocol 3.0 installation to date.

GM plans to install broadband MAP networks at Saturn's body, drive train and assembly plants. Each network is expected to support up to 250 nodes.

The plants are scheduled to start producing the new Saturn car line beginning next June. The secrecy shrouding the operation has spawned a number of rumors — one of them that GM was considering alternatives to MAP for at least some of its manufacturing operations.

Proponents of the de facto network standard hope that GM's decision to commit Saturn to MAP 3.0 will inspire other organizations to follow suit. Many companies have been reluctant to commit to MAP because they believe the technology is still too immature.

Although a majority of the Fortune 500 companies are represented in the MAP/TOP Users Group, only about 30 companies in North America have installed MAP, group officials estimate.

"It's going to be another year or two before we'll see widespread adoption of MAP," said Walter Silbaugh, a networking specialist in Hewlett-Packard Co.'s St. Paul, Minn., sales office. "There is a lot of user interest in MAP, but implementation is going very slowly. It's going to take some real success stories to get things going."

Lagging interest

The MAP/Technical and Office Protocol 3.0 specification was completed and frozen for a six-year period after the Enterprise Networking Event (ENE) in Baltimore in June 1988. Freezing the standard and demonstrating at ENE how 101 dissimilar systems could interoperate on a single multivendor MAP/TOP network was supposed to in-

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Merrill Lynch to farm out its net management duties

MCI, IBM prep to take over sprawling network.

By Barton Crockett
Senior Editor

NEW YORK — Merrill Lynch & Co., Inc. last week detailed plans to have MCI Communications Corp. and IBM take over its network management operations.

Under the terms of the deal spelled out in a letter of intent, MCI, the prime contractor, and IBM, a subcontractor, will integrate Merrill Lynch's existing network management systems under NetView.

Management of the network will be handled primarily by IBM and MCI personnel from network control centers in Merrill Lynch facilities here and IBM facilities in Raleigh, N.C.

As part of the deal, 45 to 50 Merrill Lynch employees out of the brokerage firm's approximately 70-person network management department are expected to be transferred to IBM and MCI payrolls.

While the deal had been previously reported ("MCI to manage Merrill Lynch net operations," *NW,* Aug. 28), no details of the arrangement had been divulged.

The pact, which is to be signed by late October, is valued at $50 million over five years. It will complement a $150 million, five-year contract Merrill Lynch signed last June with MCI for long-haul and private-line services ("Merrill Lynch to sign MCI as lead carrier," *NW,* June 12).

According to DuWayne Peterson, Merrill Lynch's executive vice-president of operations, systems and telecommunications, farming out network management operations to MCI and IBM will enhance the brokerage firm's net management capabilities.

"It's not that there's a cost savings associated with this," Peterson said. "We're advancing our capabilities at about the same cost we pay today."

As part of the deal, MCI and IBM will work together to design a system that will integrate seven existing Merrill Lynch network management systems under NetView.

The net management systems will be tied to an AIX-based (IBM's version of the Unix oper-

(continued on page 72)

Briefs

Some '800' insurance. AT&T last week rolled out the Service Assurance Plan, a free program that gives users backup options if their AT&T 800 service is disrupted or the carrier takes longer than usual to provide service. The plan applies to new and existing customers of AT&T's interstate, domestic 800 service, and 800 Readyline, Megacom 800 and Advanced 800 services.

In the event of a complete outage, customers can have AT&T provide temporary 800 Readyline service over any working telephone line, answer 800 calls with a recorded message or route calls to one of three other AT&T 800 services the customer uses: domestic 800 service, 800 Readyline and Megacom 800. All routing is free of charge.

Datapoint to up Arcnet speed. Datapoint Corp. is scheduled to introduce a 20M bit/sec version of its Arcnet local network at NetWorld '89 in Dallas this week. The new version is eight times faster than the 2.5M bit/sec Arcnet first introduced more than 12 years ago. Standard Microsystems Corp. and NCR Corp. will license the technology.

Strike woes continue. The International Brotherhood of Electrical Workers (IBEW) in New Jersey ratified a three year contract with New Jersey Bell Telephone Co. last week, paving the way for Communications Workers of America (CWA) and IBEW workers in the Bell Atlantic Corp. region to return to work.

Settlements had been reached earlier with CWA workers in the region and for IBEW workers in Pennsylvania, but the New Jersey chapter of the CWA had honored the IBEW picket line. At press time, the month-old CWA and IBEW strikes continued against Nynex Corp., although union and carrier negotiators met almost daily last week.

NCR shares ISDN plans. NCR Corp.'s Workstation Products Division last week said it is developing Integrated Services Digital Network interface boards for personal computers. The company also plans to develop voice/data applications for ISDN workstations that will enable users to support such features as voice mail and messaging.

Bush proposes fiber net. The Bush administration last week presented a proposal to Congress for construction of a $400 million high-speed fiber network that would link the nation's university, corporate and government research centers. Sources say the new network — the National Research and Education Network — would be 50,000 times as fast as the existing Internet research network. Plans for the new net are part of a larger proposal recommending that roughly $2 billion be spent over the next five years to support development of high-performance hardware and software.

3Com looking up. 3Com Corp. last week said orders and sales in August will result in positive earnings per share for its fiscal 1990 first quarter ended Aug. 31. Orders are expected to be about $95 million and sales about $89 million. 3Com will release complete first-quarter results in two weeks.

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Sea-Land Services, an international transportation company, is installing a T-1 network to reduce data and voice communications costs, and increase available bandwidth. **Page 19**

Local Networking
3Com went on the systems offensive recently, introducing with considerable fanfare a new turnkey local network it is positioning as a minicomputer alternative. **Page 23**

Management Strategies
Six years ago, J.C. Penney saw opportunities in the burgeoning third-party network services market. Now the user-turned-vendor is seeing profits. **Page 31**

Products & Services
Siemens Information Systems and its subsidiary, Tel Plus Communications, introduced a hybrid key system/PBX that supports as many as 192 trunks and 384 stations. The companies also announced a family of digital telephones, as well as attendant console and button expansion units. **Page 35**

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IBM enhances 3174, adds host connectivity options

Firm also beefs up NetView's controller support.

By Paul Desmond
Senior Writer

NEW YORK — IBM last week announced microcode for its 3174 Establishment Controller that gives users new options for linking 3174-attached devices to mainframes and beefs up controller support under NetView.

With Release 2 of the 3174 Configuration Support B microcode, terminals, personal computers and other devices attached to a 3174 via an IBM Token-Ring Network can access up to three different Systems Network Architecture hosts through the 3174.

The new microcode also makes it possible for network managers to perform on-line controller diagnostics from a NetView console instead of having to use a terminal attached directly to the controller.

The 3174 enhancements expand on IBM's May introduction of a new generation of 3174s, dubbed Establishment Controllers ("IBM overhauls 3174, broadens 3745 line," *NW,* May 8). Analysts heralded last week's announcements as evidence that IBM intends for the 3174 to play a larger role in SNA nets.

"They're beginning to formalize a three-level hierarchy — host, front-end and Establishment Controller," said Atul Kapoor, vice-president of Kaptronix, Inc., a consulting company in Haworth, N.J.

The 3174 now supports connections that were once only possible from a front-end processor, he said.

One of the enhancements to the new microcode, dubbed Multi-Host Token-Ring Gateway, expands on a similar multihost feature announced in May, which lets dumb terminals hard-wired to a 3174 communicate with as many as three hosts via a Concurrent Communication Adapter.

The Multi-Host Token-Ring Gateway also uses the adapter and lets any device on a Token-Ring communicate with up to three hosts via the 3174, which acts as a Token-Ring gateway.

Devices appear to the host as Type 2 physical units emulating a 3270 controller, or they can be supported via Advanced Program-to-Program Communications/LU 6.2 sessions, said George Mills, IBM's product planning manager for the 3174. Previously, users needed separate gateways to reach each host.

Another new feature, dubbed Central Site Control Facility, enables NetView operators to conduct diagnostic tests on remote 3174 controllers. From a NetView console, users can test the 3174 Token-Ring gateway, collect error information and event logs, gather response time information, initiate corrective procedures, display configuration panels and display product data about devices attached to 3174s.

The ability to downline load product data — such as serial number and machine type — to the 3174 is a new feature intended especially to support terminals manufactured prior to January 1988. Newer terminals can communicate some of this product data to 3174s, Mills said.

The new feature lets users store as much as 50 bytes of data on the device supported on each controller port as well as 50 bytes for the 3174 itself.

Besides product data, net managers can elect to input the user's name, terminal location and servicing agent to facilitate tasks such as inventory, device location and problem resolution. Data is stored on the 3174 and can be accessed and entered via NetView, Mills said.

Configuration Support B Release 2 should be available on June 29, 1990, although the Multi-Host Token-Ring Gateway is not expected to be available until Dec. 28, 1990. Release 2 is available at no extra charge to current users. It costs between $250 and $1,100, depending on the 3174 model used.

Union Carbide opts for 5 Generic 2 PBXs from AT&T

By Bob Wallace
Senior Editor

DANBURY, Conn. — Union Carbide Corp. last week said it has awarded AT&T a contract for five Definity 75/85 Communications System Generic 2 private branch exchanges — the largest known order for the new AT&T switch.

The user said the new Definity Generic 2s offer more advanced networking features and can support more lines than the antiquated, topped-out AT&T Dimension PBXs they will replace.

Landing the Union Carbide contract is a major coup for AT&T and represents a strong statement of user acceptance for the Definity product line, according to industry analysts. AT&T estimated the contract value to be $7.5 million.

Union Carbide selected the AT&T PBX over switches from IBM/Rolm Systems Division and Northern Telecom, Inc.

"We chose AT&T because their [Definity] Generic 2 offered the most functionality and flexibility and met our business needs," said Paul Pollino, corporate telecommunications manager for Union Carbide. "AT&T's proposal did the best job of meeting our service and support requirements."

According to Bruce Robin, a principal with Robin & Dackerman, a consulting firm in Marina Del Rey, Calif., the contract is "a major commitment by a Fortune 500 company. This deal lets the competition and other large users know that AT&T has a winner in Definity."

The Definity 75/85 Communications System, announced in February, marries the capabilities of AT&T's System 75 and System 85 PBXs and is available in two models, the Generic 1 which can serve 100 to 1,600 lines and the Generic 2 which can support as many as 30,000 lines.

Under the contract, AT&T will install and cut over a Definity Generic 2 configured to support 4,000 lines in place of three interconnected AT&T Dimension switches at Union Carbide's corporate headquarters here in November.

The switch maker will install four more Definity Generic 2s in place of Dimensions at four Union Carbide buildings in Charleston, W. Va., and cut over the four PBXs on Feb. 24. The company is contemplating the purchase of three more Definity Generic 2s in the next six months. Union Carbide declined to say where they would be used or which switches they would replace.

The contract also calls for AT&T to install fiber-optic backbones in certain Union Carbide buildings, implement fiber interface devices on some floors and run twisted pair to the desktop.

The chemicals and plastics manufacturer will replace a voice-messaging service provided by a service bureau with AT&T's Audix stand-alone voice mail system, which will be accessible from anywhere in the country using a single 800 number.

After issuing a request for proposal a year ago, Pollino formed a steering committee comprising top executives from several different Union Carbide business units and representatives from the firm's technical and purchasing departments.

After Union Carbide awarded the contract to AT&T but before signing it, Pollino and members of the steering committee met with AT&T's Definity development team to discuss the switch maker's future PBX product strategy. "We did not want to install hardware that would be obsolete one or two years down the road," Pollino said. "AT&T said the new Definity architecture would carry us well into the future."

AT&T wins new Tariff 12 victories

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C.— AT&T last week expanded its stable of Tariff 12 custom network customers when it signed multimillion dollar contracts with New York-based PaineWebber, Inc. and Kemper Financial Companies, Inc. of Chicago.

If the two tariff filings take effect as scheduled on Oct. 16, it will bring the number of custom networks designed by AT&T for large corporate customers to 13. The two contracts are among some of the smaller deals AT&T has struck thus far.

The PaineWebber contract is worth a minimum of $10 million annually for five years; the deal with Kemper Financial Companies is worth a minimum of $7 million annually for five years.

The largest Tariff 12 contract, believed to be for General Electric Co., is worth at least $60 million annually for five years. The smallest is also a contract with General Electric for international services, which is valued at a minimum of $2.16 million annually for five years.

> Pollando said AT&T won the contract because it was more responsive.
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> ▲▲▲

PaineWebber's custom net will link the firm's corporate headquarters in New York to 270 domestic locations, including its data center in Weehawken, N.J. The net will also serve sites in Puerto Rico and the Virgin Islands. It will include 203 data lines — 17 T-1 lines and 186 9.6K bit/sec data lines — and 220 private lines used for voice.

PaineWebber received bids from MCI Communications Corp. and US Sprint Communications Co. in addition to AT&T. Previously, the company bought network services from all three carriers and American Satellite Co.

Tom Pollando, corporate vice-president of communications, said AT&T won the contract because it was more responsive and put more resources into the job. "It wasn't [that we were looking for] the lowest price — all the prices were very competitive. It was the full service that AT&T was able to provide," Pollando said. The firm estimated that the deal will cut its current $2 million monthly network costs in half.

Rates for on-net switched voice calls are priced according to seven mileage bands and the time of day. During business hours, rates range from 4.5 cents per minute for a 200-mile call to 9.5 cents per minute for calls over 4,250 miles.

If PaineWebber's annual charges exceed $15 million, it will be eligible for a volume discount. The company will receive a 2.25% discount on charges between $15 million and $17.5 million; a 4% discount on charges between $17.5 million and $20 million; and a 5% discount on charges of more than $20 million. The total discount may not exceed $1 million over the life of the contract.

Before signing the Tariff 12 deal, Kemper Financial Companies reviewed a network bid from MCI Communications Corp. Previously, the company was using about 15 vendors for communications services, including AT&T.

"Tariff 12 is an opportunity to custom-design the network and make it efficient for your own needs and your own growth projections," said Frank Diaz, president of Kemper Services Co., an arm of Kemper Financial Companies. "Working with over 15 vendors made life too confusing, and we really weren't using our purchasing power. Tariff 12 let us deal with all of these issues."

The company projected that the network will save millions of dollars each year in communications costs but declined to provide a specific savings estimate.

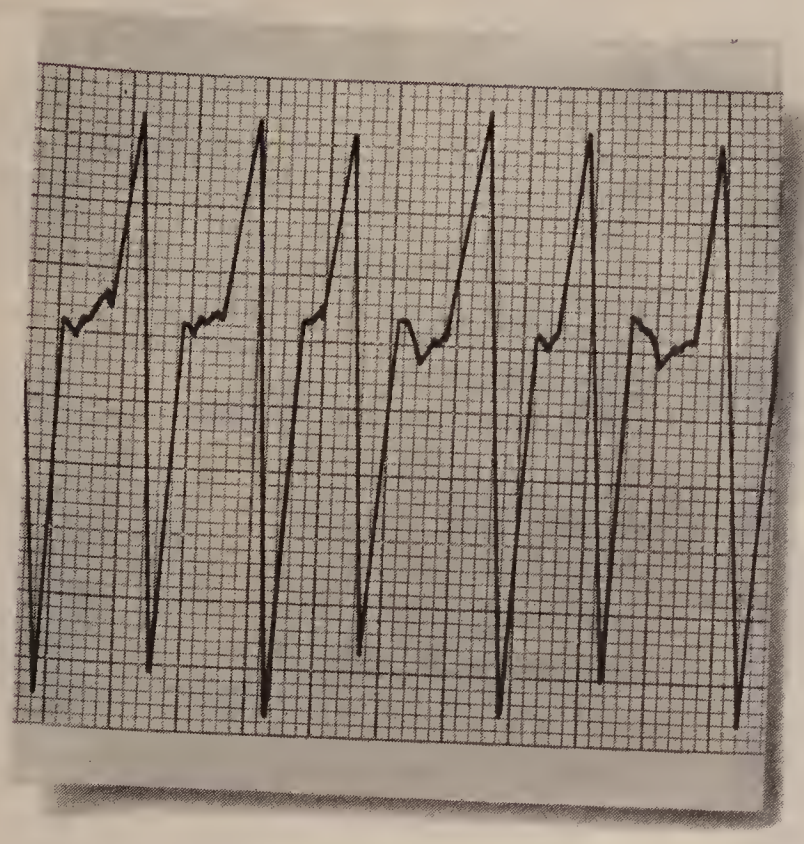
Additionally, AT&T will provide a customized network management and billing service for Kemper Financial Companies. The network will include 316 data lines, comprising 10 T-1s, seven 56K bit/sec lines and 299 9.6K bit/sec lines.

Rates for switched voice calls are based on seven mileage bands and the time of day. Prices for on-net calls range from 5.5 cents per minute for a 200-mile call to 9.2 cents for a 1,500-mile call, and 11.6 cents for calls over 4,250 miles.

In addition, Kemper Financial Companies qualifies for a volume discount any time its monthly charges exceed $100,000. It receives a 3% discount for charges between $100,000 and $250,000; a 5% discount for charges between $250,000 and $400,000; a 7% discount for charges between $400,000 and $750,000; a 9% discount for charges between $750,000 and $1.25 million; and a 12% discount for charges over $1.25 million.

Correction: Due to a printer's error, the photographs of IBM's John Hunter and Rich McGee were misidentified in the story "As SNA milestone looms, IBM shares future vision" in the Sept. 4 issue. We regret the error.

"My doctor told me to cut down my stress. So I switched long distance companies."



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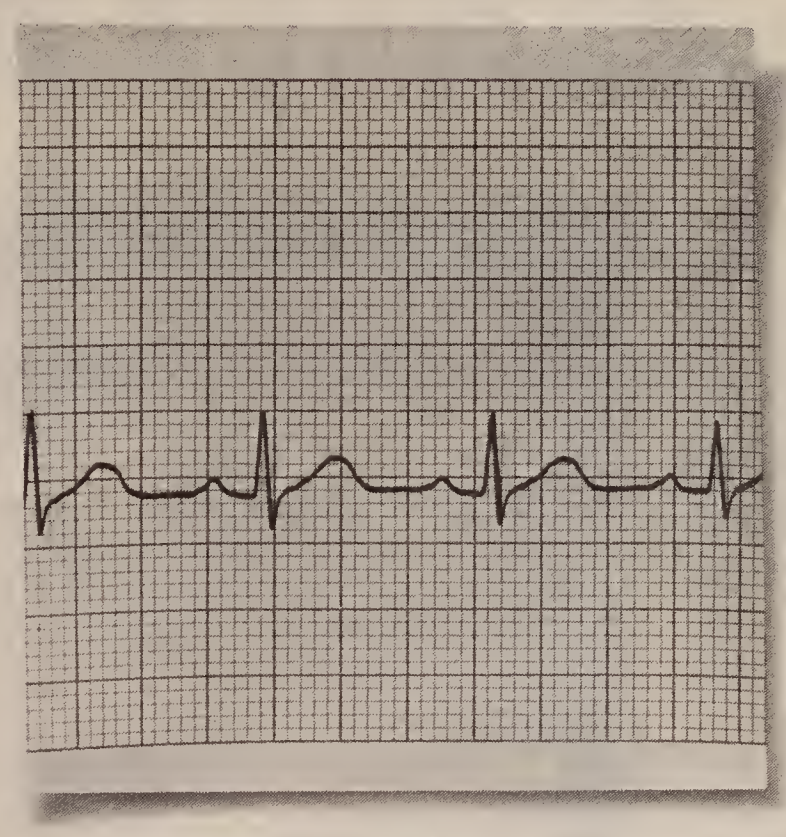

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Survey finds user investments in EDI paying substantial dividends

By Wayne Eckerson
Staff Writer

CHICAGO — Investments in electronic data interchange are paying big dividends for U.S. corporations, according to a new Coopers & Lybrand survey of major users.

The survey shows that after an initial start-up period averaging three years, users can significantly enhance their bottom lines through cost savings and new revenues generated by EDI. Titled "Current Trends in Electronic Data Interchange," the survey is based on interviews with about 100 EDI users from a variety of industries, over half of which had annual revenues of greater than $1 billion.

Six percent of the companies surveyed said they expect to add $1 million or more to their earnings through use of EDI by the end of 1990; another nearly 20% said EDI would add between $100,000 and $1 million to their earnings. A quarter of the respondents said EDI would increase their bottom lines by as much as $100,000.

"It takes most companies about three years to generate enough EDI transactions to get back their initial investment and begin reaping significant cost savings," said Michael Manion, the survey's coordinator and manager of EDI Consulting Services at Coopers & Lybrand here.

EDI has a dramatic impact on the cost of doing business. Typically, it costs companies $5 to process an intercompany paper transaction vs. just $1 to process an electronic one, Manion said. Once companies begin increasing their EDI transaction volumes, they quickly start realizing the financial benefits of EDI, he said.

For example, Union Carbide Corp.'s Chemicals & Plastics Business Group began sending purchase orders to suppliers in 1987 and since then has doubled the number of transactions every year, according to Bob Jones, EDI program manager for purchasing and distribution at the company's Charleston, W.V., plant.

In addition, the company began receiving electronic invoices from suppliers last year and is currently testing a system that will make electronic payments based on those invoices. On the customer side, Union Carbide began receiving purchase orders last year and will soon send customers electronic invoices as well.

The company's transaction volume has already grown enough to cover the fixed costs of establishing the system, Jones said, and additional transactions are yielding significant cost savings. "All future growth is gravy," he said.

The survey showed that financial gains from EDI stem from the elimination of paper processing costs and the reduction of data entry errors. Plus, many larger companies with EDI links to suppliers cited cost savings from reduced inventories through just-in-time production and delivery arrangements.

Other respondents said EDI enabled them to retain major business partners that were migrating their order and billing systems to EDI, which gave them a competitive advantage over other companies in attracting new business.

Companies also expect to spend more as they expand their use of EDI and add more trading partners to their EDI nets in the next few years. Only 22% of the companies surveyed spent $100,000 or more on EDI in 1988, but 36% of the companies said they expect their EDI expenditures will exceed $100,000 by 1990.

> "All future growth is gravy," Jones said.
>
> ▲▲▲

Survey respondents indicated that one-third of their EDI costs stem from training trading partners in the use of EDI and establishing EDI links between companies. EDI software accounted for 23% of EDI costs, network services for 22%, internal staff training for 16% and management consulting services for 4%.

Many EDI users are also spending money to integrate information systems and EDI systems, modifying existing applications to accept incoming EDI information. Of the companies surveyed, 28% are currently modifying their order entry systems and 21% are modifying billing systems to streamline operations.

Supplier side economics

On the supplier side, 22% of the companies surveyed are integrating their purchasing systems with EDI and 14% are integrating their payable systems to accept EDI input. By 1990, almost one-third of the companies will be altering their payables to take greater advantage of EDI.

By far, the information most frequently exchanged between companies is purchase orders. Fifty-one percent of the survey respondents exchange purchase orders with customers, while 31% exchange invoices and 29% swap shipping notices. Other data that companies exchange via EDI with customers includes material releases (20%), remittance details (8%) and payment orders (6%).

"In every industry, the first EDI transactions among trading partners were for purchase orders," Manion said. "Purchase orders set the financial transaction cycle in motion, and the rest follows soon after."

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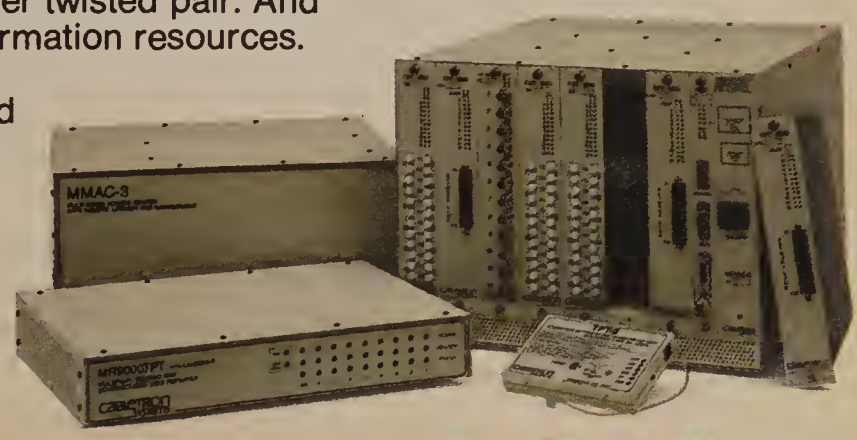

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Booth #3010

US Sprint to unveil new digital data transmission services at TCA

Carrier plans rollout of fractional T-1, 64K bit/sec offerings.

By Bob Wallace
Senior Editor

SAN DIEGO — US Sprint Communications Co. is expected to announce several new digital data transmission services, including fractional T-1, at the Tele-Communications Association, Inc.'s annual TCA-89 conference here later this month, *Network World* has learned.

According to sources, the carrier will roll out fractional T-1 services (offered in 56K bit/sec increments), a 64K bit/sec offering dubbed Clearline Voiceband and a service similar to AT&T's Dataphone Digital Service.

US Sprint confirmed plans to offer the services but declined to discuss them further. The services will augment US Sprint's existing digital services, which include its T-1 Clearline 1.5 service introduced in January 1988.

The carrier's introduction of fractional T-1 service comes several months after AT&T announced its Accunet Spectrum of Digital Services, which are fractional T-1 services available in 64K bit/sec chunks ("AT&T fractional T-1 services hit market," *NW,* May 1). MCI Communications Corp. will formally announce fractional T-1 service next month, according to a company spokesman.

Analysts say US Sprint will be a formidable competitor in the nascent fractional T-1 market. "US Sprint's entry into the market means AT&T is going to have some very heavy price competition, and that's great news for users," said Mark LaRow, a senior manager with Network Strategies, a consulting practice of Ernst & Young in Fairfax, Va.

"AT&T's services are already priced very competitively," he said. "It'll be interesting to see how much lower US Sprint's rates will be."

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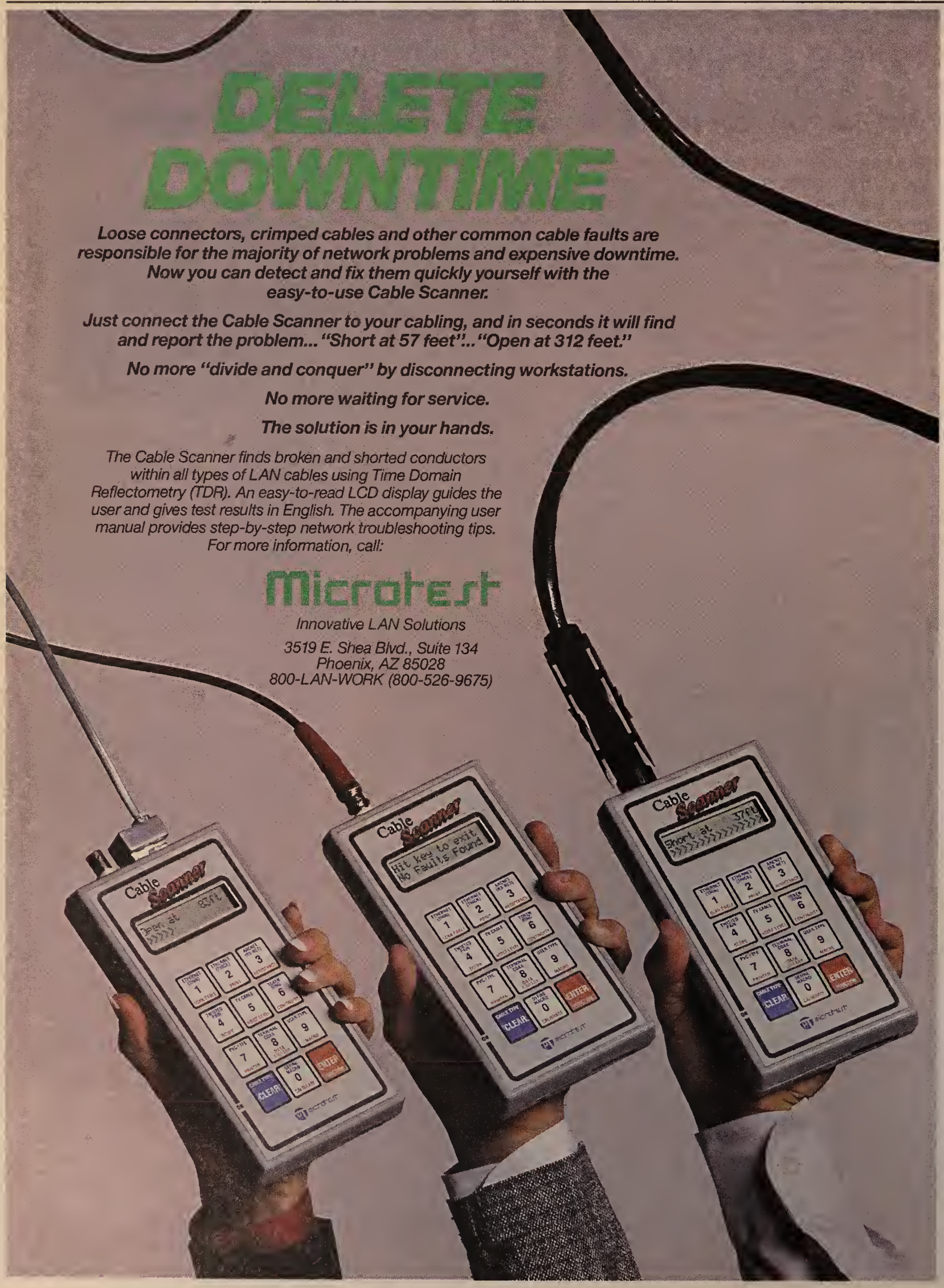

IBM, hospital to study voice/data applications

By Tom Smith
New Products Editor

PHOENIX — St. Joseph's Hospital and Medical Center here last week said it will work with IBM to identify integrated voice/data applications tailored for users in the health care industry.

Hospital officials and IBM declined to discuss specific applications under consideration, but they said the goal of the project is to identify ways to streamline and expand services provided to patients and doctors using the health care facility.

As an example, officials said integrated voice/data technology may be used to improve billing procedures and extend ad-

(continued on page 74)

DCA may spin off wide-area network group

By Jim Brown
Senior Editor

ALPHARETTA, Ga. — Digital Communications Associates, Inc. last week said it is considering spinning off its wide-area network group as a separate company or selling the unit.

DCA management said it is looking into options for its Network Communications Group, a division that sells T-1 multiplexers and other wide-area net products. The move was mandated by the company's board of directors, which is hoping to boost the value of DCA stock.

DCA, which had sought to become a one-stop supplier of network goods, acknowledged it has had difficulty merging the wide-area unit with its Personal Computer Communications Group, which sells microcomputer-to-mainframe links and local net products.

"The increasing complexity of the voice and data communications marketplace is making it difficult to build synergy," the company said in a prepared statement.

Since the two groups' product lines have little overlap in function, DCA must maintain separate sales and marketing forces that specialize in each area. And because the product architectures vary, the company must also have two manufacturing facilities. As a result, analysts say DCA's stock is undervalued. "DCA has been under a lot of pressure to enhance shareholder value," said Glen Pafumi, an independent consultant in Madison, N.J. Spinning off the Network Communications Group as a separate company or selling the unit could help push up DCA's stock price.

A DCA spokesman said no decision has been reached on a course of action and did not set a timetable for any action. DCA executives were unavailable for comment.

The announcement comes on the heels of a disappointing financial report issued in July. Earnings for DCA's fiscal year ended June 30 were $17.7 million. Those earnings were diluted by a $12.6 million charge related to the acquisition of

(continued on page 71)

Worth Noting

Sony Corp. of America in New York has formed a new division to develop video communications products and services. T.C. Browne was named vice-president and general manager of the new unit, known as the Video Conferencing and Satellite Systems Division.

People & Positions

US West, Inc. last week announced the formation of the Capital Assets Group and named **James Ozanne** president and chief executive of the new unit, effective today.

The new group will give the company added strength and experience in the financial services area.

With the addition of the group, US West will have three major operational units, the others being US West Communications and US West Diversified Group.

Previously, Ozanne was executive vice-president of General Electric Capital.

In a separate announcement, US West named **Pearre Williams** vice-president of its Commercial Development Division.

Williams will have responsibilities in the merger and acquisition activity area and will report to **Robert Runice,** vice-president of US West and president of the Commercial Development Division. Previously, Williams was senior counsel for the tax, mergers and acquisitions group.

Amdahl Corp. recently consolidated all of its data communications products within a single organization, the **Amdahl Communications Products Group.**

Formation of the group merges the company's line of front-end communications processors with its network-

(continued on page 10)

HP strategy shift paying off for users

By Tom Smith
New Products Editor

TEMPE, Ariz. — Hewlett-Packard Co.'s new strategy of offering personal computer-based file servers and minicomputers for supporting work groups and departments promises dramatic savings for users, according to a study by The Sierra Group, Inc., based here.

For its report, "1989 Cost of Ownership — Hewlett-Packard Co.," The Sierra Group asked HP to recommend solutions for the networking requirements of groups of four, eight, 16, 32, 50 and 100 users. The firm's guidelines address issues such as printers per user and amount of storage and response time. All workstations included network hardware and software.

The company said the cost of the systems proposed in 1989 was considerably lower than those for the systems HP recommended the previous year. That's primarily because of HP's flexibility in offering cost-effective personal computer-based servers and its traditional minicomputers as the heart of the work group and departmental systems, according to The Sierra Group.

When measured against last year's network recommendations, HP's 1989 recommendations, which also utilize software from third parties, resulted in savings of 36% for 16-user networks to 51% for 100-user configurations.

The best blend

"Rather than rely on its proprietary minicomputers as the only solution for users, HP is blending the best of the proprietary world with industry-standard client/server solutions that are in growing demand in organizations," the firm reported.

> The cost of the systems proposed in 1989 was lower than those recommended in 1988.
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Systems profiled for each user population "are intended to represent typically the best and final proposals in a highly competitive situation," the study said.

(continued on page 11)

INDUSTRY BRIEFS

Ameritech Development Corp. last week made what it called a strategic investment in **Touch Communications, Inc.,** saying it will work with the Campbell, Calif.-based company to create new Open Systems Interconnection software products. The size of the investment was not disclosed.

Bill Fello, Touch Communications president and chief executive officer, said the partnership will enhance his firm's efforts to penetrate the large user and systems integration markets. Ameritech Development said working with Touch Communications will make it easier for the company to bring solutions based on Government OSI Profile standards to its major customers.

Touch Communications produces OSI products for DOS, VAX/VMS, Macintosh and Unix environments.

Data General Corp. has agreed to license **Hewlett-Packard Co.**'s NewWave software for use in its new office automation product line.

NewWave is an application environment that helps users move and update information among different applications and schedule routine tasks that a computer carries out automatically. It has a graphical user interface based on object management technology. DG said it plans to use NewWave technology within its Distributed Applications Architecture to provide a common user environment across multiple platforms.

Advanced Telecommunications Corp. (ATC), a regional long-distance firm serving business and residential customers in the Southeast and Southwest, agreed last week to buy **Galesi Telecommunications, Inc. (GTI)** and its wholly owned long-haul subsidiary, **Telus, Inc.** for about $150 million.

Telus has about 100,000 customers throughout Florida, and

(continued on page 11)

RBHCs set sights on global marketplace

With MFJ restrictions shackling them at home, Baby Bells wade into new arenas internationally.

By Bob Brown
and Gail Runnoe
Network World Staff

Faced with line-of-business restrictions in the U.S., the regional Bell holding companies are aggressively pursuing opportunities in new markets overseas.

The RBHCs are involved in a variety of projects abroad, including technology transfer agreements with foreign carriers, mobile communications, information services and cable television.

The companies are hoping to leverage their communications expertise to cash in on the rapidly expanding world networking market and gain experience in market sectors from which they are currently banned in the U.S. That experience, they say, will aid them in dealing with users running international networks and help them hit the ground running in the U.S. if Modified Final Judgment business restrictions are removed.

Bells abroad

Edgar Brown, who in July was named president of Bell Atlantic International, Inc., Bell Atlantic Corp.'s European subsidiary, said his firm is focusing on four key areas overseas: computer maintenance, strategic alliances with foreign carriers in such countries as Spain and the Netherlands, mobile communications, and computer and telephone equipment leasing.

The company has joined a consortium that is bidding for a digital cellular telephone license in West Germany and may bid for a license to build and operate an advanced mobile communications network in the U.K.

> The RBHCs hope to leverage their expertise to cash in on the networking market.
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"We are developing plans that put us in a position to better serve our customers by adding value to the telecommunications services they have today," Brown said.

Bell Atlantic currently derives about 1.5% of its nearly $11 billion in annual revenue from international operations but figures to increase that share to 5% by the mid-1990s, Brown said.

Ameritech's international strategy centers on partnerships with foreign carriers, said Jerry Malik, president of Ameritech Development Corp., the Ameritech division in charge of defining new market opportunities. About a year ago, Ameritech established a staff-exchange relationship with Japan's Nippon Telephone and Telegraph, Ltd., the country's prime carrier.

> "Many of our customers are looking to develop a foreign presence," Malik said.
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"Many of our customers are looking to develop a foreign presence," Malik said. "To establish telecommunications services in many countries is very difficult. We think that by establishing relationships with the PTTs, we can better serve our U.S. customers' needs." As an example, he said, Ameritech could offer advice to its U.S.-based customers looking to extend networks abroad.

Last month, a consortium including US West International, Inc. was awarded a contract by the Hong Kong government for the world's single largest cable television franchise. The consortium also won the right to provide data communications services to business and residential customers in Hong Kong.

The RBHCs are prohibited from offering cable television services in the U.S.

RBHC officials acknowledged that one of the factors motivating their international efforts is the opportunity to experiment in businesses from which they are barred in the U.S. The RBHCs are restricted from manufacturing communications equipment, providing long-distance service and offering information service content in the U.S. But the companies are hopeful that the bans will soon be lifted.

The RBHCs have avoided long-distance service and manufactur-

(continued on page 10)

RBHCs set sights on global marketplace

continued from page 9

ing overseas because of established competition and questionable profit potential. But offering information services is an attractive opportunity. Executives from Bell Atlantic International and US West International said their firms are looking into information services abroad.

However, Charles Coe, president of BellSouth International, Inc., warned that trying one's hand at new businesses abroad could be "a bit naive." The RBHCs still don't have strong name recognition overseas and may face obstacles in dealing with foreign carriers and competition from vendors with a home field advantage, he said.

"It is the perception of a lot of people that the U.S. always has the lead in all areas of telecommunications, and that's not the case," Coe said.

BellSouth International has focused on mobile communications opportunities abroad, a market BellSouth Corp. has tackled in the U.S., he said. Among BellSouth International's mobile activities is its part in a consortium, headed by the French water utility, that has been selected to provide a second cellular network throughout France, as well as its membership in another consortium that will provide a cellular mobile communications net in Argentina.

BellSouth International brings experience to its overseas partners in these ventures and also acquires knowledge that can be useful in operating its U.S. mobile communications services, Coe said.

The American carriers have also been shot down in a few international forays.

The most visible disappointment for an RBHC so far was the U.S. District Court's rejection early this year of Nynex Corp.'s bid to buy Private TransAtlantic Telecommunications Systems, Inc., a McLean, Va.-based company that is building a transatlantic cable with Cable & Wireless PLC of London. The acquisition would have given Nynex a 50% interest in the cable.

> The RBHCs may have trouble dealing with foreign carriers.
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The U.S. District Court later gave Pacific Telesis Group permission to buy 10% of an undersea transpacific cable, proving that such investment options are possible for the RBHCs.

Overall, the challenge facing the RBHCs is making users aware that they can provide global communications services, according to Rick Levitz, a vice-president and partner in the telecommunications industry practice of AT Kearney, Inc. in New York. "The RBHCs have a two- to three-year window of opportunity to make themselves known as viable global systems integrators," Levitz said. "It could be the difference between them becoming general contractors and subcontractors for multinational projects."

People & Positions

continued from page 9

ing products, including network management systems, X.25 network processors and T-1 multiplexers.

Samuel Ezekiel was named vice-president and general manager of the new group. Most recently, Ezekiel was general manager of Amdahl's Communications Systems Division.

Randy Phillips has been named president and chief executive officer at **Racal InterLan**, a Boxborough, Mass.-based local network vendor.

Phillips succeeds **Michael Bennett,** who left the company in early June.

Previously, Phillips was vice-president and general manager at Inmac, Inc.'s Datacom Division.

Racal InterLan is a unit of the Racal Data Communications Group, a subsidiary of Racal Electronics PLC in the U.K.

BNR, a research and development subsidiary of **Northern Telecom Canada, Ltd.** located in Research Triangle Park, N.C., recently announced the appointment of **Ian Stewart** as vice-president for network services and head of the company's Research Triangle Park-based laboratory.

Stewart said he will focus on the evolution of Northern Telecom's digital switching strategy.

He succeeds **Rod McPherson,** who was appointed vice-president for marketing at Northern Telecom in Dallas.

John Pollpeter was recently named area vice-president for the Ameritech Region at **Rockwell Communication Systems (RCS)** in Des Plaines, Ill.

Pollpeter will represent the office of the president of RCS, developing and maintaining relationships with Rockwell customers while coordinating marketing and sales strategies for RCS products within the Ameritech region.

Previously, Pollpeter was vice-president and general manager of RCS's Switching Systems Division.

RCS is a division of Rockwell International Corp. in Dallas.

Voicemail International, Inc. in Santa Clara, Calif., recently named **William Colescott** director of engineering.

Colescott will be responsible for guiding Voicemail International's development efforts to meet the market of the 1990s.

Previously, Colescott was director of software development at Speech Plus, Inc., a Sunnyvale, Calif.-based company.

WESTINGHOUSE COMMUNICATIONS

"Business needed a telecommunications company that treated network management as a *management* problem, not just a technology issue."

—Oliver MacKinnon
Westinghouse Communications Software

HP strategy shift paying off for users

continued from page 9

For example, in 1988, HP recommended for 16 users a Starlan network linking its Micro 3000LX minicomputer with its Vectra personal computers, a configuration with a total hardware and software cost of $118,294.

In 1989, the company recommends its Vectra ES/10 personal computer as a file server, linked over a Starlan network to Vectra personal computers. That solution costs $74,769, or over 36% less than the 1988 solution.

With all costs in five years of ownership factored in, the cost per user in 1988 was $11,337; in 1989, it was $7,749, or 31.6% lower.

In addition, the per-user cost of HP's minicomputer-based work group systems has dropped an average of 23%. This decrease is partly the result of HP retiring the 3000/52 and 3000/70 models, and replacing them with the 3000 MicroGX, which boasts higher performance at a lower price.

Less for support

Revised software maintenance pricing means a significantly lower proportion of total system costs is devoted to software support.

"The key to this new strategy is HP's decision to price PC-based software on a per-user basis, while charging a single monthly support and maintenance fee for the entire environment," according to the report.

Unix System V group gets new HQ, members

By Bob Brown
Senior Editor

PARSIPPANY, N.J. — Unix International, Inc. last week announced the opening of its worldwide and European headquarters, as well as the appointment of several top executives and the addition of 25 new members.

Unix International is an independent association of Unix System V users, vendors and developers.

The group's new world headquarters will remain here, but it has been moved to a much larger facility designed to handle the association's growing needs, a Unix International spokesman said.

At the opening of the group's headquarters, Peter Cunningham, Unix International president and chief executive officer, announced the addition of two senior staff members.

David Sandel was named vice-president of worldwide marketing and R. Layne Weggeland was appointed vice-president of business planning and operations. Tom Mace, interim vice-president of marketing, has returned as scheduled to Unix International member company Unisys Corp.

Cunningham said it was important for Unix International to have a "permanent team of experienced executives to assure that the process works efficiently and effectively."

Unix International, which has roughly 15 European members, also announced the opening of its European headquarters in Brussels, Belgium. Steinar Hoistad was named European operations director.

Hoistad's responsibilities include directing the organization's European membership in defining and specifying the direction of Unix System V, which has about 10 million users worldwide.

In a separate announcement, Unix International said it has added 25 new members to its rolls, bringing Unix International's membership to 100.

New members include Teradata Corp., The Santa Cruz Operation, Inc., Nippon Telephone & Telegraph Data Communications Systems Corp. and end users such as Keio University in Tokyo. The list includes nine members from Asia, six from Europe, one from Australia and nine from North America.

Unix International's members represent the key providers of Unix systems in the marketplace, but more user input is being encouraged, Cunningham said.

"We expect a significant increase in membership over the next few months as universities and other users groups join our organization," he said.

Industry Briefs

continued from page 9

together the companies will serve 270,000 customers. ATC acquired Florida-based **Microtel, Inc.** last year and Texas-based **ClayDesta Communications Corp.** in March of this year.

GTI shareholders will receive 6.5 million shares of ATC common stock in exchange for all GTI common stock and equivalents. The purchase is subject to shareholder and regulatory approval, and should be completed in November, ATC said.

Unisys Corp. last week announced it will form an imaging systems group to support the company's thrust into digitized image processing.

The imaging systems unit will be headed by Fred Meier, formerly vice-president of business development for the Unisys Network Computing Group. Meier will be responsible for developing and implementing a cohesive strategy for the company's payment and document imaging systems.

Unisys said the emerging market for the integration of digitized document images with traditional computer-based information management could generate revenue in excess of $5 billion by 1992.

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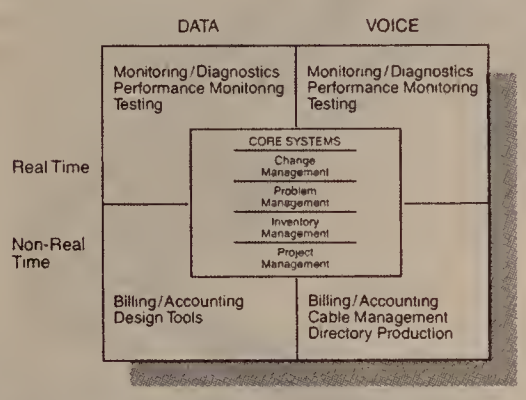

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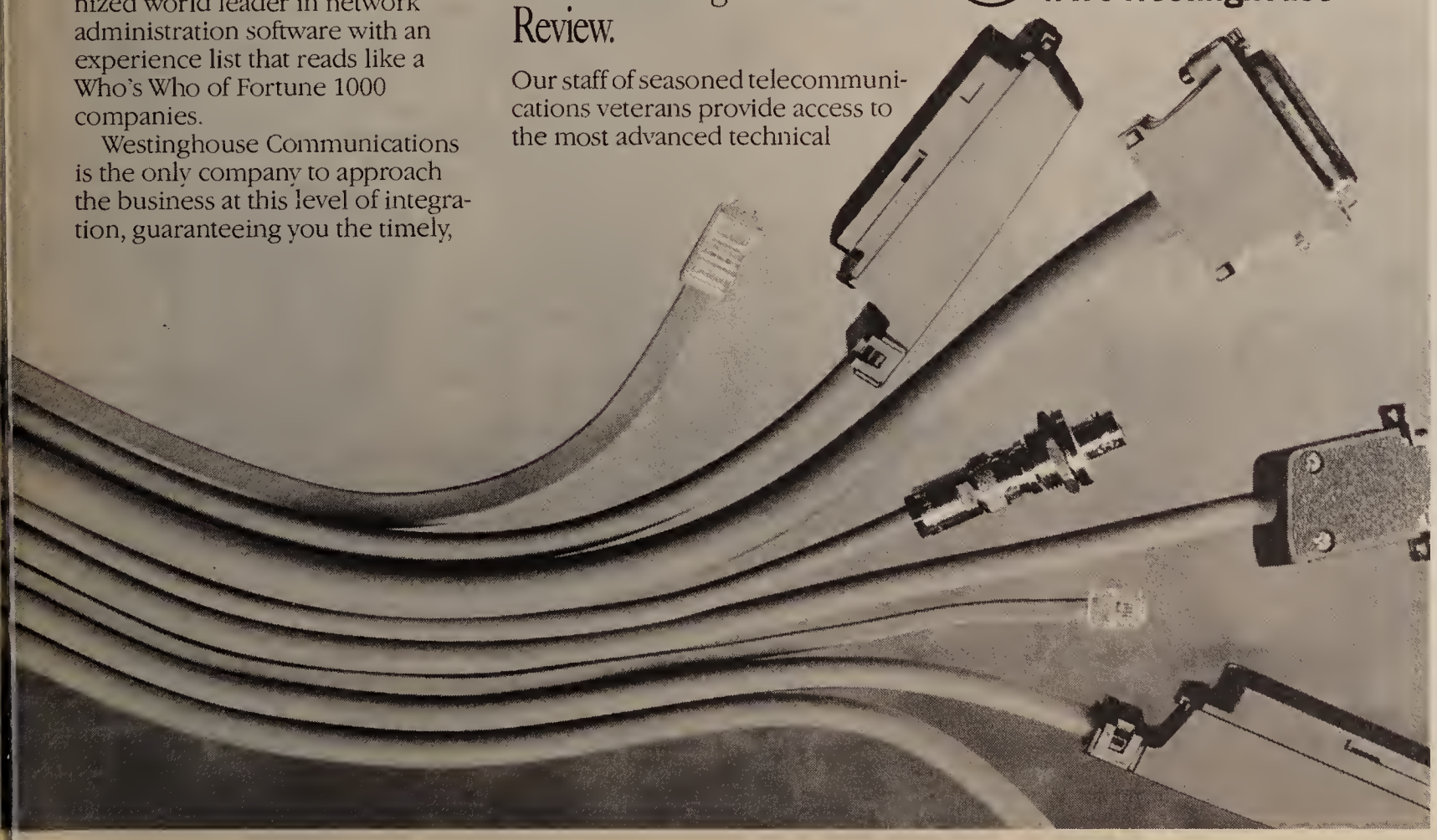

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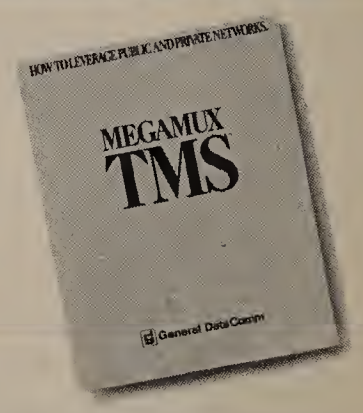

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Worth Noting

The United States Telephone Association, a trade group representing 1,371 local telephone companies, said its members had invested a total of $242.3 billion in plant by the end of 1988, and that figure should rise to $255 billion by the end of 1989.

Carrier Watch

Southwestern Bell Telephone Co. announced last week it has begun offering its Voice Messaging Service (VMS) to business customers in Dallas, Houston, Kansas City, Mo., and St. Louis. Next year, the service will be rolled out in San Antonio and Austin, Texas, Little Rock, Ark., Tulsa, Okla., and Topeka and Wichita, Kan.

VMS allows customers to send, receive and broadcast recorded messages using a push-button phone. Service features include the ability to broadcast messages to a list of recipients and to set up mailboxes for more than one person on the same number.

The company said VMS benefits users by reducing telephone tag and allowing companies to develop messages for customers.

Southwestern Bell declined to provide charges for the service, saying each contract will be negotiated individually. A spokesman said VMS will be priced according to a number of variables, including length of contract, number of mailboxes and access to optional services such as paging.

Metropolitan Fiber Systems of San Francisco, a subsidiary of Metropolitan Fiber Systems, Inc. (MFS), said it has completed construction of a 923-route-mile fiber-optic network in San Francisco.

With the backbone complete, the bypass service provider will connect individual

(continued on page 14)

AT&T denies breaking the rules about CPE bundling

Carrier asks commission to drop US Sprint case.

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — AT&T's intensified efforts to keep existing customers and win new corporate accounts has landed it in the middle of a legal controversy, but the long-distance giant is beginning to fight back.

In its first formal response to a US Sprint Communications Co. complaint filed with the Federal Communications Commission in July that seeks up to $9 million in damages, AT&T has denied all charges and asked the FCC to dismiss the issue.

US Sprint and other competitors allege that some of AT&T's marketing efforts violate numerous provisions of the Communications Act of 1934 as well as the FCC's Second Computer Inquiry rules prohibiting the bundling of equipment with regulated transmission service.

In its July complaint, US Sprint accused AT&T of luring away Service Corp. International (SCI), a national provider of funeral services based in Houston, by offering free and reduced-price equipment if the customer signed a three-year contract for Software-Defined Network (SDN) service.

Valued between $500,000 and $1 million, the equipment promised included D-4 channel banks and private branch exchanges, according to US Sprint.

US Sprint also claimed that AT&T priced its SDN service below its tariffed rates, thereby violating provisions of the Communications Act prohibiting carriers from deviating from tariffed prices and discriminating between similar customers.

> US Sprint claimed that AT&T priced its SDN services below its tariffed rates.
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AT&T admitted in a filing with the FCC that it offered to sell SCI three System 75 PBXs with Definity Generic 1 upgrades at a reduced price but denied that the

(continued on page 18)

WASHINGTON UPDATE

BY ANITA TAFF

AT&T asks to drop price of its Megacom 800. AT&T has proposed lowering rates for its Megacom 800 offering for all service areas and time periods. Although decreases vary slightly between service areas, all of the rates will be reduced approximately 5% for all time periods.

If the price reductions take effect Oct. 16 as scheduled, charges for Megacom 800, which is priced on a per-hour basis, will range from $9.19 to $12.25 during the day; $7.51 to $10.00 in the evening; and $6.26 to $8.34 for the night/weekend time period. Prices vary by service area.

In its filing, AT&T told the Federal Communications Commission that the price reduction is necessary to make its services more competitive. Because the proposed rate cuts exceed the allowable decreases specified under price cap regulation, AT&T was required to provide cost support data showing that the lower prices will cover the cost of providing service.

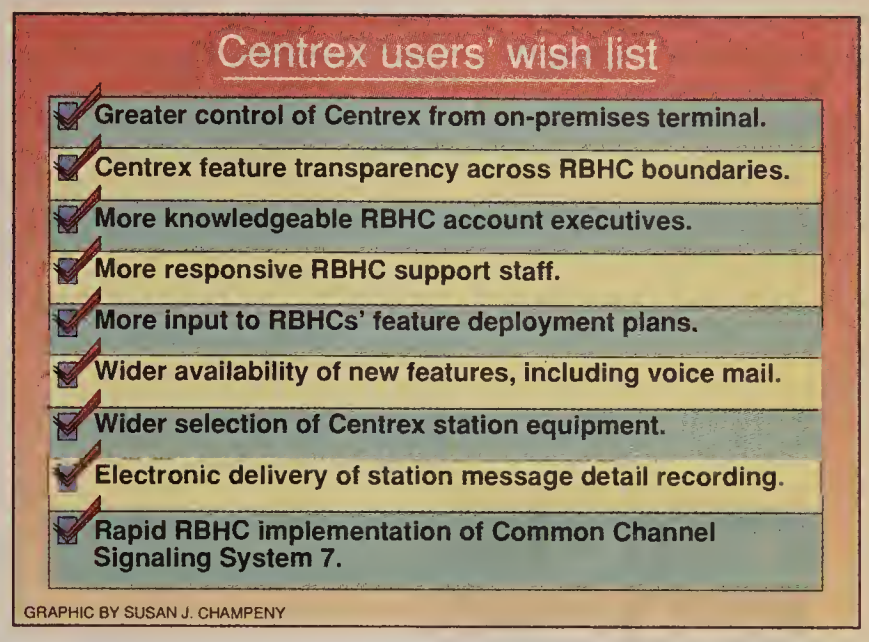
Contel cashes in with big contracts. Contel ASC, based here, has won three contracts worth $2.4 million to provide backup satellite networks for Fireman's Fund Insurance Co., United Stationers, Inc. and Bowne & Co., Inc.

United Stationers, the nation's largest wholesaler of office products, is purchasing a satellite network connecting 14 cities. If the company's terrestrial-based system fails, the net will provide alternate routing for its electronic order entry system.

Bowne & Co., a financial printing company, will connect 200 typesetting terminals at 32 financial centers with its data center in Piscataway, N.J.

The company — which produces time-sensitive documents

(continued on page 14)



GRAPHIC BY SUSAN J. CHAMPENY

Centrex users look to future with CCS7

The signaling technology will support nascent functions and features, save on tie line costs.

By Bob Wallace
Senior Editor

Forward-thinking Centrex users are waiting for the advanced functionality that will become available when the regional Bell holding companies implement Common Channel Signaling System 7 (CCS7).

CCS7 will facilitate Centrex networking by eliminating the need to use tie lines to link Centrex serving offfices. It will also substantially reduce call setup times and enable the RBHCs to deliver new calling features such as calling number identification.

Dan Gonos, store systems director for Domino's Pizza, Inc., said one of the things he looks forward to with CCS7 is citywide Centrex. With citywide Centrex, multiple Centrex serving switches are networked using CCS7 signaling, making it possible to support uniform dialing plans.

"I would be able to dial a three-, four- or five-digit telephone number and reach the telephone at the next desk or one at another Centrex site across town. In an areawide scenario, I could conceivably reach a [site] 50 to 100 miles away," Gonos said.

Networking central office switches would likely improve store-to-store communications. "Today, we have stores in the same city that are served by different central offices. If an employee at one store wants to call another store, he has to remember a tie line number — which you can't expect him to do," he said.

In a CCS7 environment, when a Centrex user places a four- or five-digit call, the switch passes the call setup information to a signal transfer point (STP) that supports multiple Centrex serving offices.

If the call is destined for a remote Centrex, the STP instructs the originating switch to translate the call into a seven-digit number and route it accordingly.

With the STPs handling the telephone number translations, Centrex users no longer need tie lines to support calls between sites, Gonos said.

Like Domino's, the University of Texas Cancer Center is also looking forward to the implementation of CCS7.

"We have two locations outside our LATA that are served from other central office switches. [CCS7] would be a more efficient way of interconnecting them," said Marilyn Katzman, telecommunications services director for the 25-building medical center.

> "A four- or five-digit [Centrexwide] dialing plan would be a benefit," Katzman said.
>
> ▲▲▲

"A four- or five-digit [Centrexwide] dialing plan would be a big benefit for us. It'd make site-to-site communications quite a bit easier," Katzman added.

The CCS7 out-of-band signaling system sets up calls much faster than in-band signaling systems widely used today because it uses a subnetwork to reserve a call path before the call is actually placed.

"With [CCS7], call setup time is almost imperceptible. A call to

(continued on page 14)

Users look to future with CCS7

continued from page 13

the other end of the state could be set up as quickly as a call to the desk next to you," Gonos said.

In addition to pushing for rapid implementation of CCS7, large Centrex users are demanding greater control of their systems. RBHCs are responding by deploying on-site terminals — such as Ameritech's personal computer-based CentrexMate — that let users move, add and change phones, collect and analyze traffic data, and electronically submit and track service orders.

CentrexMate allows users to establish a dial-up data link with the Centrex serving office. "I can submit normal moves, adds and changes, which are handled in about an hour, or request priority changes that only take 15 minutes," said Jim Yeip, a telecommunications analyst with Federal Mogul Corp.'s information resource management department.

CentrexMate also lets users change calling features on a per-telephone basis in near real time and submit service orders electronically. Federal Mogul began using the system several months ago, Yeip said.

"We no longer have to send paper orders at $7.50 a pop to the Michigan Bell [Telephone Co.] business office and wait three or four business days to get the change done. I can do a change in a matter of minutes — and that's a major improvement," Yeip said.

But other Centrex users, including the University of Texas Cancer Center's Katzman, can't justify an on-site terminal. "Right now, [CentrexMate] is a luxury we can't afford. But, we're hoping to get one in the near future," she said.

Feature availability across RBHC borders is also of high importance to users. Gonos, who has set up Centrexes in five of the seven RBHC territories, said, "A feature that's readily available in Ameritech's region may not be available in BellSouth [Corp.]'s territory, and vice versa."

In 1987, Gonos and a core group of Centrex users created the National Centrex Users Group, in part, to address this issue. "When we ask for a feature that's not yet available, the RBHCs' replies range from 'in a few months' to 'not planned,' " Gonos said. The process is frustrating because the RBHC usually has the switch software needed to support the feature, he added.

Gonos said he will raise the issue of feature transparency when the group meets in Atlanta from Nov. 8 to 10.

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Call your telephone company and ask for the system that helps everyone do the best job—Meridian Digital Centrex and business sets from Northern Telecom.

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Carrier Watch

continued from page 13

buildings to the net and then bring the fiber net on-line, said Anthony Pompliano, president and chief executive officer of Oakbrook Terrace, Ill.-based MFS.

Metropolitan Fiber Systems of San Francisco's fiber network will serve more than 19 million square feet of downtown office space.

MFS runs fiber bypass nets in Baltimore, Boston, Chicago, Philadelphia and Minneapolis and is building other fiber nets in Houston and Los Angeles, according to a company spokesman.

Tigon, a voice-messaging service bureau owned by Ameritech, recently bought the equipment and customer base of Eliot VoiceMail, a small voice-messaging service bureau in Minneapolis.

Terms of the sale were not disclosed.

Eliot VoiceMail customers' voice mail traffic will be brought onto Tigon's nationwide voice-messaging network on Oct. 1, according to a company spokesman. These users will now be able to send voice messages to users in any Tigon Network Center in the U.S., U.K., Europe and Japan.

Washington Update

continued from page 13

such as prospectuses that are filed with the Securities and Exchange Commission — will use the satellite net to keep operations going in the event that its terrestrial circuits fail.

Fireman's Fund Insurance will connect its data centers in Phoenix and San Rafael, Calif. The company will access its new satellite network on an as-needed basis and, therefore, will pay for transmission capacity only when it is used.

At this point, it's hard to tell which end of the system is in charge.

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The fifth in a series to help set the record straight.

The Fax Myth

*Based on average business customer calling patterns, average monthly AT&T bill over $120, 10% of which is fax. MCI rates as of 8/2/89. Actual savings may vary.

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Destroyed.

Our competitor says their fax network is the best way to fax.

So why does it require 57% more retransmissions and cost more than AT&T?

According to a recent Bell Labs study, using five-page fax transmission tests, MCI's fax network transmits one unreadable page out of every twelve. In fact, their network is 57% more likely than AT&T to transmit pages that are partially unreadable.

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AT&T

The right choice.

AT&T denies breaking CPE rules

continued from page 13

discount hinged on the user purchasing SDN service.

The carrier denied US Sprint's allegations about the channel banks, saying the prices it included in its bid to SCI were for D-4 channel banks from an outside vendor. Those prices were not contingent upon the customer purchasing transmission service, AT&T said.

However, AT&T also acknowleged that it had informed SCI it might be able to offer free channel banks once a promotional tariff filed at the FCC was approved. That tariff, which was filed one day before AT&T and SCI signed a contract for service, would have allowed AT&T to offer free equipment to new users of Megacom, Megacom 800 and SDN services.

The promotion never took effect because after studying the proposal for almost two months, the FCC rejected it as unlawful.

AT&T said it then informed SCI it would not be able to offer free channel banks. It added that SCI has now purchased the equipment from another vendor.

The long-distance carrier also denied US Sprint's charges that it was offering SCI below-tariff SDN rates. AT&T said in its filing that the SCI contract calls for service to be provided "pursuant to the rates, terms and conditions provided in AT&T's interstate tariffs." AT&T also said it has not yet begun to provide SDN services to SCI.

Late last month, US Sprint filed another complaint with the FCC alleging that AT&T won a contract to provide Megacom service to the University of Nevada at Las Vegas by offering to sell the school a $15,000 D-4 channel bank for about $600.

About half of the price reduction was to come from a promotion offered by AT&T's unregulated equipment operation that waived the installation charge. The other half was to come from a concurrent promotion offering customers a $7,500 credit for subscribing to Megacom.

US Sprint claimed that by running the two promotions at the same time, AT&T was tying equipment purchases to service contracts. The carrier asked the FCC for a monetary award to compensate for the business lost to AT&T. Although US Sprint didn't specify the exact amount it was seeking, Leon Kestenbaum, counsel for the carrier, said the figure could be as high as $9 million.

MCI Communications Corp. and the Independent Data Communications Manufacturers Association have also filed complaints with the FCC alleging that AT&T is bundling equipment and services.

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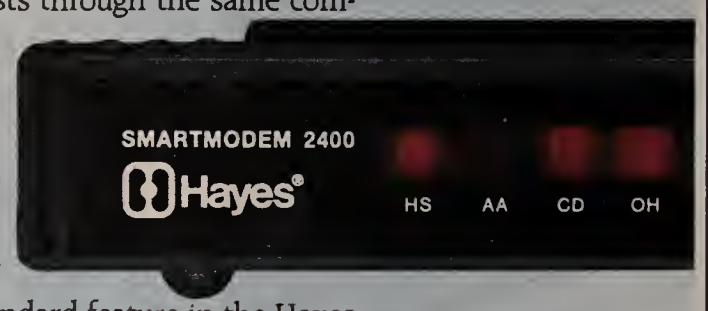

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*Using software which incorporates the Hayes Synchronous Driver (HSD) purchased from CQ Computer Communications, Digital Communications Associates, or Network Software Associates.
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US Sprint proposes T-1 rate cuts

By Bob Wallace
Senior Editor

KANSAS CITY, Mo. — US Sprint Communications Co. last week said it will reduce rates for its Clearline 1.5 point-to-point T-1 service by 7% to 28% and will lower the minimum usage level for volume discounts from $20,000 a month to $10,000.

As an added incentive to attract business, US Sprint will continue to waive T-1 access fees of up to $3,620 for each Clearline 1.5 circuit installed before Dec. 15.

US Sprint said it has reduced rates for Clearline 1.5 by an average of 22% to 24% overall since the service was first announced in January 1988. The new rates are scheduled to take effect Nov. 1.

US Sprint offers 60 different Clearline 1.5 service plans, which vary depending on circuit length, contract length, traffic volume commitment and other criteria.

Clearline, the carrier's first private-line product, is the only nationwide, all-fiber private-line service available today, according to a US Sprint spokeswoman. The carrier owns and operates a 22,248-route-mile fiber network.

US Sprint, which entered the T-1 market years after rivals AT&T and MCI Communications Corp., said it holds less than 10% of the T-1 market but expects to build on its base.

"We're not where we want to be yet, but we're growing quickly," the spokeswoman said.

DATA COMMUNICATIONS

PRODUCTS, SERVICES, ARCHITECTURES, STANDARDS AND NETWORK MANAGEMENT

Worth Noting

"With satellites, nobody has invented a 22,000-mile-long screwdriver yet. So once you put one up there, it better work and it better work right. If it doesn't, you could render the satellite useless."

Bruce Crockett
President
Communications Satellite Corp.'s
World Systems Division
Washington, D.C.

Data Packets

Racal-Milgo last week introduced its Excalibur 19.2 leased-line modem which operates at 19.2K bit/sec. The modem is the first in a family of Excalibur products Racal-Milgo plans to introduce over the next few months. Others include additional leased-line modems, dial-up modems and data service units that are used to access digital data services.

Excalibur 19.2 comes in a stand-alone enclosure and includes a front-panel LCD display. The LCD displays information that helps users monitor and control central site and remote Excalibur 19.2s.

Excalibur 19.2 can automatically reestablish a failed leased-line connection over dial-up facilities and features password protection that prevents unauthorized users from reconfiguring the device via the front panel.

Lastly, Excalibur 19.2 supports a Multiport Option that allows the unit to support six data terminal devices. Outfitted with the Multiport Option, Excalibur 19.2 can act as a time-division multiplexer that lets all six devices share a 19.2K bit/sec circuit, or it can act as a port-sharing device that enables six data terminal devices to take turns transmitting data at 19.2K bit/sec. Excalibur 19.2 is priced at $6,300. The Multiport Option costs an additional $1,200.

Net will accept credit cards for airport parking charges

N.Y., N.J. Port Authority hires Nynex for project.

By Jim Brown
Senior Editor

NEW YORK — The Port Authority of New York and New Jersey is building an electronic funds transfer network that will enable motorists to use credit cards to pay parking fees at the three airports in its jurisdiction.

The network will help reduce pilferage and fraud, and will also speed cash transactions at John F. Kennedy International, LaGuardia and Newark International airports, which pulled in about $80 million in parking fees last year.

The Port Authority recently awarded a seven-year, $33.5 million contract to Nynex Corp.'s Information Solutions Group to design, install and maintain the network. Under the contract, Nynex will install Trindel American Corp. ticket dispensers at parking lot entrances as well as ticket checkout terminals and cashier consoles at parking lot exit lanes.

In addition, an automated teller machine-like Trindel device, called an automated precashiering machine (APM), will be installed in such areas as airport baggage claims to enable motorists to prepay parking charges while waiting for bags.

The Trindel equipment in each airport will be linked via fiber-optic cable supporting T-1 speeds to Tandem Computers, Inc. CLX minicomputers at each airport.

The CLX minicomputers, running Tandem's NonStop SQL data base management system, will be linked via a channel on the Port Authority's existing microwave

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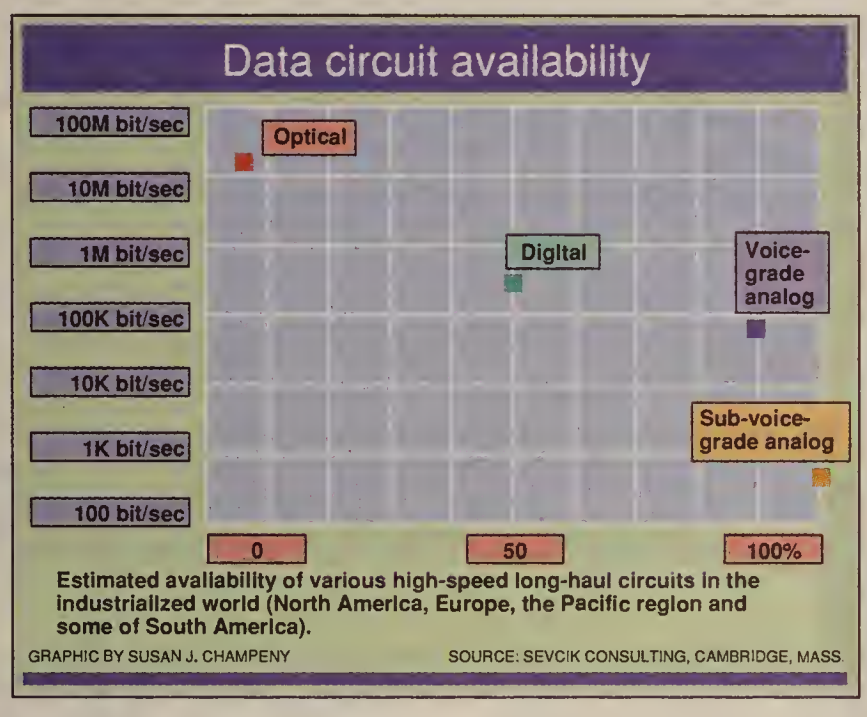

Estimated availability of various high-speed long-haul circuits in the industrialized world (North America, Europe, the Pacific region and some of South America).

GRAPHIC BY SUSAN J. CHAMPENY SOURCE: SEVCIK CONSULTING, CAMBRIDGE, MASS.

HP unwraps X.400 packs for Unix line

By Tom Smith
New Products Editor

PALO ALTO, Calif. — Hewlett-Packard Co. recently announced X.400 messaging software for its Unix minicomputers, as well as three products that enable personal computers to exchange electronic mail with the Unix-based hosts.

The products are HP's first X.400 offerings that operate in the Unix environment. Until now, HP only supported X.400 on its minicomputers that run its proprietary MPE operating system.

HP OpenMail is X.400 messaging software that runs on the company's HP 9000 Series 800 and Series 300 processors running HP-UX, which is based on AT&T's version of Unix.

In addition, the company introduced HP AdvanceMail III, an MS-DOS-based personal computer E-mail program that enables personal computer users to exchange E-mail with HP OpenMail hosts. HP also unveiled two terminal-emulation programs — HP AdvanceLink for Macintosh and HP AdvanceLink for Windows — that let personal computers appear as HP terminals to the Unix hosts.

HP OpenMail

With HP OpenMail, users of HP terminals establish a Unix session with the HP 9000 minicomputer in order to send and receive X.400 messages.

Pricing for HP OpenMail ranges from $3,900 to $21,500,

(continued on page 22)

Cargo data is transmitted between ports via a T-1 backbone.

Shipping firm looks to T-1 net for edge

Int'l transportation company says network will save $350K, increase data transmission capacity.

By Paul Desmond
Senior Writer

ELIZABETH, N.J. — Sea-Land Services, Inc., an international transportation company, is installing a T-1 network to reduce data and voice communications costs and increase available bandwidth.

The 18-month-old, 12-node network, now more than half complete, promises to cut costs by $350,000 per year and increase data transmission capacity fourfold while providing Sea-Land with its first dedicated voice circuits.

The network, based on equipment from Timeplex, Inc., supports voice, data and video within the U.S. and digital links to sites in Asia, Europe and the Middle East.

Sea-Land plans to supplement the T-1 backbone with fractional T-1 services as it proceeds with its plan to distribute processing from its data center here to dispersed regional sites, said Al Forestier, manager of network planning for the company.

> Sea-Land plans to supplement the T-1 backbone with fractional T-1 services.
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The data center supports about 110 sites worldwide — including shipping terminals, sales offices and dispatching centers — and is used to transmit corporate financial data and information regarding the movement of cargo.

The backbone is replacing a bundle of 9.6K bit/sec links and a few 56K bit/sec circuits used to tie the data center to 14 company sites in the U.S., typically major shipping terminals. These nodes serve as network hubs for smaller surrounding sites.

> The backbone is replacing a bundle of 9.6K bit/sec links and a few 56K bit/sec circuits.
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The company has already begun to realize its projected annual savings of $350,000 by cutting loose numerous 9.6K bit/sec lines and redirecting some voice traffic from an MCI Communications Corp.'s virtual network to the T-1 backbone.

International links

International company sites in Asia are supported by three 64K bit/sec satellite links — one from San Francisco to Yokohama, Japan; one from San Francisco to Hong Kong; and one between Hong Kong and Yokohama.

Sites in Europe are supported via four 64K bit/sec links from New York to Rotterdam, The Netherlands, two of which are satellite-based. From Rotterdam, a 19.2K bit/sec line runs to Dubai, United Arab Emirates, from which lower speed lines stretch to other points in the Middle East.

In the first quarter of 1990, the 19.2K bit/sec link will be upgraded to a 64K bit/sec line, and the company will complete a ring

(continued on page 20)

Shipping firm looks to T-1 net for edge

continued from page 19

around the globe with the installation of a 64K bit/sec line between Dubai and Hong Kong, Forestier said.

The domestic T-1 network, which is based on Timeplex Link/1, Link/2 and mini/Link multiplexers, has helped Sea-Land eliminate an array of hardware, including statistical multiplexers and modems, Forestier said.

Today, the company's mesh-type T-1 net has nodes in Oakland, Calif., Philadelphia and San Francisco plus four in the New York metropolitan area. Additional T-1 nodes are planned for Atlanta; Chicago; Jacksonville, Fla.; Long Beach, Calif.; Seattle and possibly Fort Lauderdale, Fla., and New Orleans.

The metropolitan New York sites supported by T-1 include the data center here, company headquarters in Edison, N.J., a shared hub earth station on Staten Island, in New York and a Contel ASC switching center at New York's World Trade Center.

The latter two sites support Sea-Land's very small aperture terminal satellite links, which include two of the four 64K bit/sec links from New York to Rotterdam and a 384K bit/sec fractional T-1 link to Seattle. Likewise, the San Francisco T-1 node supports satellite links to Hong Kong and Yokohama.

Additional VSAT nodes in Houston, New Orleans, Oakland and San Juan, Puerto Rico, are used as hot backups to the terrestrial T-1 net, Forestier said. The VSAT links are on-line at all times but are rarely used because the Link equipment automatically selects the most efficient routes, which typically are the fiber-optic-based terrestrial links. "By default, the VSATs become more of a backup than an operational link," Forestier said.

Video on tap

Sea-Land was an early user of the fractional T-1 card Timeplex introduced last January, he said. The company uses the satellite-based 384K bit/sec link to support full-motion videoconferencing between regional headquarters in Seattle and corporate headquarters in Edison. Videoconferencing not only reduces travel costs, but allows input from management personnel who would not usually travel to meetings among different divisions, Forestier said.

Cargo on the move at a Sea-Land port.

More videoconferencing is on tap in the first quarter of 1990, when Sea-Land plans to add full-motion video between Seattle and Hong Kong. That application will be supported over a single 64K bit/sec channel using equipment from Compression Labs, Inc. of San Jose, Calif.

The company will be able to use the existing 64K bit/sec link to Hong Kong to support the video transmission because when it's 7 a.m. in Hong Kong, it's 3 p.m. in Seattle. That leaves about a three-hour window for videoconferencing at times when it will not severely disrupt voice service, Forestier said.

A similar strategy will support videoconferencing between Edison and Rotterdam over a 128K bit/sec link, he said.

In the U.S., a terrestrial 768K bit/sec fractional T-1 link, provided as part of a turnkey package from Contel, supports voice and data transmission between here and Oakland, he said.

For the same amount of money the company was paying for its 9.6K bit/sec data communications lines to Oakland, it was able to install the fractional T-1 link, which also supports voice, Forestier said.

> "We have projected the voice savings to be about $140,000 per year," which will come from reductions in the company's use of MCI's Vnet, Sea-Land's Forestier said.
>
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"We have projected the voice savings to be about $140,000 per year," which will come from reductions in the company's use of MCI's Vnet virtual net service, he said.

Sea-Land will realize additional savings from a plan to use packetized voice among sites in the U.S. and some locations overseas. One product the company is testing is Timeplex's Link Packetized Voice Subsystem, which supports eight voice conversations over a single 64K bit/sec channel by eliminating the gaps in regular speech.

Long-term, the company will be looking to increase its use of fractional T-1 as its distributed processing plan rolls out, Forestier said. That plan, now in its infancy, is aimed at leveling off the processing load on the company's two IBM 3090/600 mainframes here by placing minicomputers or local networks at major ports such as Oakland, Long Beach and Tacoma, Wash. Data on cargo movements could then be processed locally rather than on the mainframe here.

"To cost-effectively connect those locations, fractional T-1 is the order," Forestier said.

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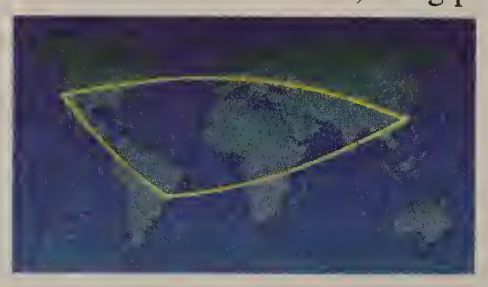

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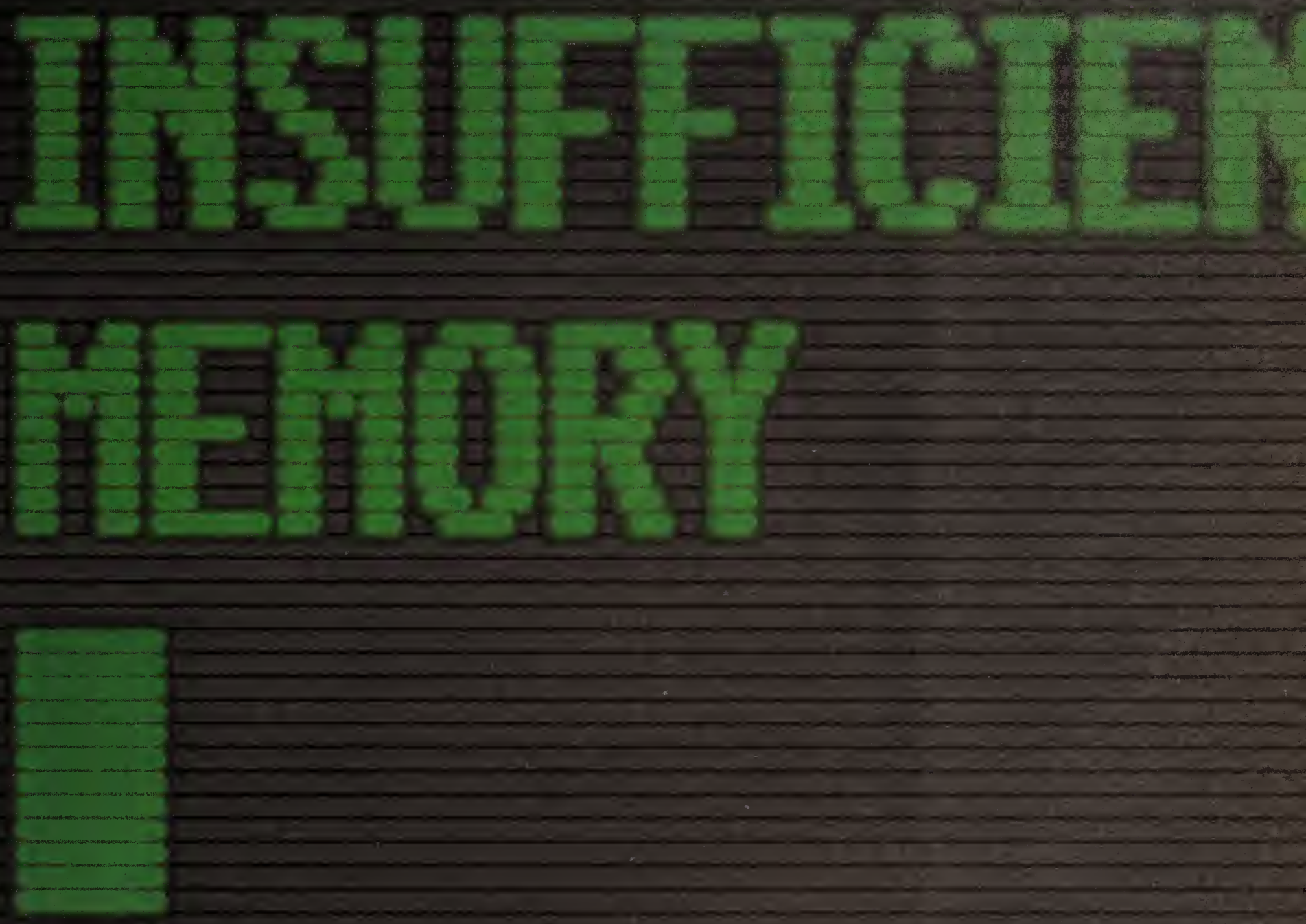

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HP unwraps X.400 packs for Unix line

continued from page 19

depending on the Unix-based minicomputer on which it runs. HP OpenMail is expected to ship in November.

AdvanceMail

HP AdvanceMail III is an upgrade to HP's existing AdvanceMail, a mail package residing in a microcomputer that is linked to an HP 3000 running MPE. The software has been upgraded to support the company's Unix-based machines.

HP AdvanceMail III lets users of MS-DOS personal computers log on to the HP 9000 and either download mail or interactively send and receive E-mail messages.

AdvanceMail III costs $420 per single-user copy. It will be available in December.

Terminal emulators

HP AdvanceLink for Macintosh and HP AdvanceLink for Windows are software packages that reside in a personal computer and enable users to establish terminal-emulation sessions with HP hosts.

Both products allow a Macintosh or an MS-DOS personal computer running Microsoft Corp.'s Windows to send and receive X.400 messages and transfer files among HP 1000, HP 3000 and HP 9000 minicomputers by emulating a terminal attached to the minicomputer.

HP AdvanceLink for Windows costs $299. HP AdvanceLink for Macintosh is priced at $299, $349 and $399 for text, graphics and color graphics versions, respectively. All are available now.

Net accepts credit cards for parking

continued from page 19

network. The CLX at LaGuardia will also be linked via leased lines to a credit card authorization network the Port Authority has yet to select.

The network is replacing a 20-year-old parking revenue collection system of stand-alone terminals at each airport. That system is so old that many replacement parts are no longer available, said Richard Pol, assistant manager of aeronautical services, who is overseeing the net project.

"We were experiencing equipment outages to the point where we felt the level of service was inadequate," Pol said. In addition, the new network's use of credit cards will keep cash out of the hands of cashiers, helping to curb pilferage and fraud.

The multiplexers used to link the Trindel equipment to the CLX minicomputers will also support a voice-grade circuit between airport operation centers and the ticket dispensers at entrance lanes.

Motorists entering a lot will take a ticket that is encoded with the time and date. If the dispenser is not working, the motorist can push an intercom button and speak with an attendant.

When motorists return to the airport, they can insert their parking claim ticket and credit card into an APM while waiting for their baggage. The APM calculates the amount due, authorizes the credit card by using the link to the credit card processor and validates the parking ticket as prepaid.

Motorists get the parking ticket back with an imprint on the front that tells them how long they have to leave the parking lot before incurring additional charges.

Pol said the Port Authority will establish a mimimum charge for credit card transactions, most likely in the $15-range. "We are really looking for people who have parked for more than a day."

The Port Authority will initially accept Visa or MasterCard and will expand to other credit cards, or even bank-issued ATM cards, if credit card transaction volumes are high enough. Based on an earlier test, Pol said he expects between 10% and 25% of motorists will use a credit card when the new networks are installed.

Airport parking lot net to speed check out.

When leaving the airport, motorists who have prepaid their charges can insert their tickets into a terminal in rapid exit lanes. That terminal will retain the ticket and open the gate. Other motorists will use manned exit lanes equipped with similar terminals that require motorists to insert their parking tickets. The terminal will calculate the amount due and display it on an attached video display screen. Forcing motorists to insert the ticket into the terminal reduces the risk of cashiers swapping older tickets for a new ticket with a lower charge and pocketing the difference.

Because workers enter the license plate number, color, make and model of each car into the Tandem minicomputers each night, when customers leave the airport, cashiers can use the license plate number to tell how many nights the car was in the lot. This prevents motorists from trying to use tickets that have a lower charge.

The new system will also increase the number of cars a cashier can check out of the parking lot to five cars a minute, up from the current level of two cars per minute, Pol said.

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Worth Noting

"In the last six months, I've called both Novell and 3Com and gotten great service. Both companies are doing everything they can to keep users happy since they're worried about losing market share."

Jim Fennessey
Director of information systems and services
Johns Hopkins School of Public Health
Baltimore

Netnotes

Excelan, Inc. last week announced LAN WorkPlace for OS/2, a Transmission Control Protocol/Internet Protocol software package for personal computers running the OS/2 operating system in Ethernet or token-ring local nets. The software permits OS/2 workstation users to swap data with other users supporting TCP/IP.

The software resides in workstation memory, which enables it to be used with any network interface controller that supports the Network Device Interface Specification, Excelan said.

The software provides OS/2 workstation users with File Transfer Protocol support, Telnet terminal-emulation capabilities and remote access facilities to link a desktop workstation with any TCP/IP host.

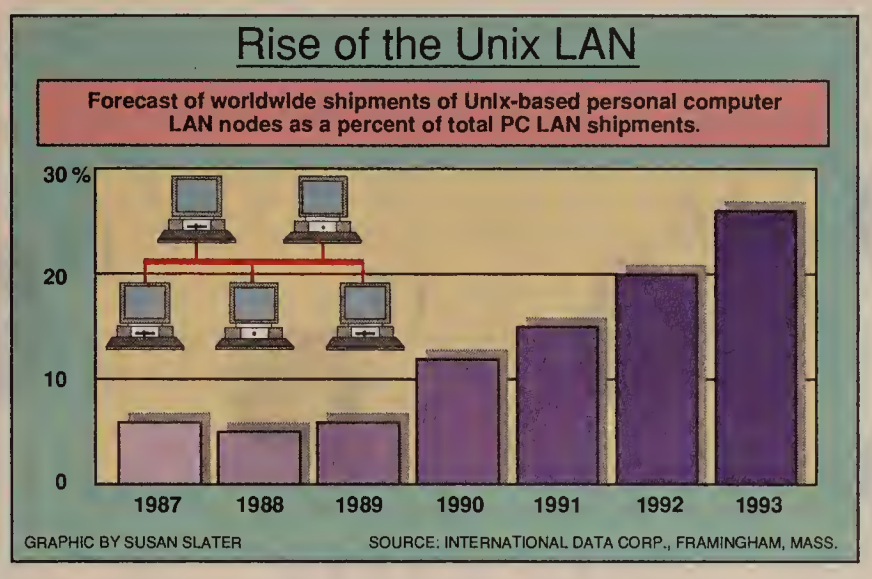
LAN WorkPlace for OS/2 costs $495 per node and is expected to ship in the fourth quarter of 1989.

Western Digital Corp. last week introduced EtherCard Plus16, a 16-bit local network adapter card for Ethernet local nets.

The company said the new card is faster than its eight-bit EtherCard Plus predecessor, which Western Digital had touted as outperforming many 16-bit Ethernet adapters.

The EtherCard Plus16 fits into the bus slot on any IBM Personal Computer XT, AT or

(continued on page 30)



Report predicts massive growth for Unix-based LANs

Study expects 2 million nodes installed by '93.

By Laura DiDio
Senior Editor

FRAMINGHAM, Mass. — The market for Unix-based personal computer local networks is poised for explosive growth in the next four years, with nearly two million new network nodes expected to be installed by 1993, according to a recent report by International Data Corp. (IDC).

The report, "Unix-Based PC LAN Operating Systems: Worldwide Forecast, 1987-1993," predicts that unit shipments of Unix-based network operating systems will soar over the next four years, according to Lee Doyle, IDC senior analyst and manager of LAN research, who authored the report. IDC is a market research and consulting firm based here.

The report forecasts that the number of nodes linked to networks running Unix-based network operating systems will climb to two million worldwide in 1993, compared with approximately 100,000 in 1988. Unix-based networks accounted for just 5% of installed local nets last year but are expected to command 18% market share by 1993, according to Doyle.

Fueling this growth is the increasing availability of Unix-based network operating systems, including versions of Microsoft Corp.'s and Hewlett-Packard Co.'s LAN Manager Unix and Novell, Inc.'s Portable NetWare. No fewer than 15 local net vendors will offer such systems by 1990.

To date, only Banyan Systems, Inc.'s VINES and Sun Microsystems, Inc.'s Network File System network operating system runs under Unix. Besides Banyan, HP, AT&T, Data General Corp., Unisys Corp., Sun and NCR Corp. are among the vendors who have said they will deliver versions of LAN Manager Unix or Portable NetWare that will be optimized to run in the Unix environment.

Also helping to boost the popularity of Unix-based local nets will be a steep increase in the use of Unix-based workstations.

Worldwide shipments of Unix-based personal computers will quadruple over the next four years, increasing from 440,000 units shipped in 1989 to 1.7 million units in 1993, according to IDC's estimates.

Unix-based LAN plans

LAN Manager

Vendor	Ship date
Hewlett-Packard Co.	4th quarter 1989
AT&T	4th quarter 1989
Digital Equipment Corp.	Projected 1990
Bull Peripherals Corp.	1990
Unisys Corp.	1990
Data General Corp.	First half 1990
Nixdorf Computer Corp.	1990
Siemens AG	1990
Sun Microsystems, Inc.	Information not available

Portable NetWare

Vendor	Ship date
Prime Computer, Inc.	1st quarter 1990
NCR Corp.	1990
Data General	1st quarter 1990
Unisys	1990

VINES

Vendor	Ship date
Banyan Systems, Inc.	Currently available

SOURCE: INTERNATIONAL DATA CORP., FRAMINGHAM, MASS.
GRAPHIC BY SUSAN J. CHAMPENY

User migration to Reduced Instruction Set Computer (RISC)-based servers is also expected to spur interest in Unix nets. As local nets increase in size and support more complex applications, the demand for powerful RISC-based servers — which primarily run in the Unix environment — will grow commensurately, Doyle said.

Unix also gives users a scal-

(continued on page 26)

3Com packages LAN as mini alternative

Firm bases new turnkey local net on client-server architecture, gets software backing from 8 vendors.

By Susan Breidenbach
West Coast Bureau Chief

SANTA CLARA, Calif. — 3Com Corp. went on the systems offensive recently, introducing with considerable fanfare a new turnkey local network it is positioning as a minicomputer alternative.

The company is packaging a new network server, an upgraded version of 3+Open LAN Manager and one or more of its diskless workstations into its Client-Server System (CSS). At the heart of CSS is 3Com's new 3Server/500, a file server based on a 20-MHz Intel Corp. 80386 microprocessor.

For security reasons, the server has no keyboard, monitor or floppy disk drive.

"It even looks like a minicomputer," said William Krause, 3Com chairman and chief executive officer, at the recent CSS introduction here. 3Com was joined at the event by eight major software developers that demonstrated products running on a 3+Open CSS local network.

CSS is based on 3Com's client-server strategy, in which personal computer workstations on a local network share applications processing with a server.

"We believe the move to the client-server architecture is unstoppable because it offers increased functionality and greater ease of use at an overall lower cost" than traditional multiuser hosts, said David Duffield, president of PeopleSoft, Inc., a software developer that demonstrated a personnel management system it developed for Eastman Kodak Co.

There was nothing revolutionary or unexpected about any of the individual products 3Com rolled out. "What is new is pricing based on a client/server configuration and applications," said Richard Kimball, an analyst for Montgomery Securities in San Francisco.

"Before, 3Com was just selling client/server systems in theory," Kimball said. "What is different is the availability of distributed applications" to back up the

(continued on page 26)

Tiara to unveil desktop diagnostics for Ethernets

By Laura DiDio
Senior Editor

DALLAS — Tiara Computer Systems, Inc. this week will introduce low-cost network diagnostic software at NetWorld '89 that enables network administrators to troubleshoot Ethernets from their desktops.

The new software, dubbed The Network Inspector, runs on an MS-DOS-based IBM Personal Computer AT or Personal System/2 and lets network administrators run diagnostics to identify hardware failures, locate breaks in cabling, pinpoint interference from "babbling nodes" — which continually transmit unintelligible data packets — and monitor network usage, according to Rich Watson, Tiara's vice-president of engineering and development.

The Network Inspector is diagnostics software that monitors network traffic and collects statistics on individual nodes or entire networks. It does not, however, have the level of functionality provided in protocol analyzer software.

The Network Inspector, for instance, can't break down data packets into their component parts and provide network administrators with detailed information on the specific protocol of individual data packets, said Frank Throckmorton, Tiara software engineer.

"Our product is designed to be a first-step, or entry-level, diagnostic tool for those users in mid-size and small business installations who want to detect network problems and monitor network traffic. These users might only be running a single protocol and, therefore, don't need the more detailed analysis of a protocol analyzer," Watson said.

But like a protocol analyzer, The Network Inspector does enable network administrators to view the packet and determine its source, destination and whether or not the data packet is normal or corrupted, Throckmorton said. Additionally, it provides the net administrator with details on individual nodes or entire networks and has the ability to monitor and filter data packets.

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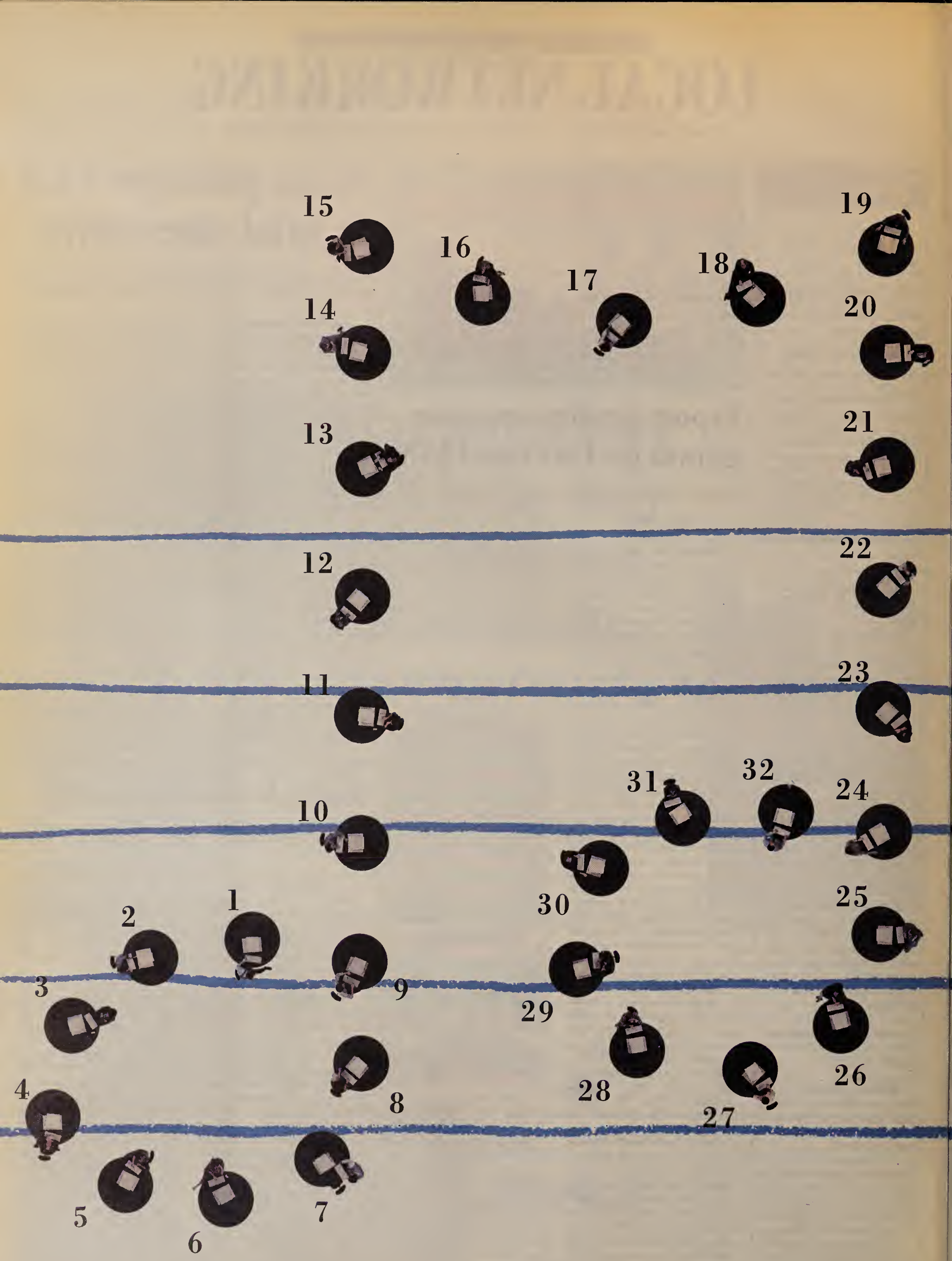
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Report predicts growth for LANs

continued from page 23

able server architecture, allowing them to migrate upward from personal computer servers to minicomputer and mainframe systems, Doyle said.

"The Unix-based network has the exciting potential to be one of the leading PC LAN networks of the 1990s," Doyle said. Until now, though, its acceptance has been very limited because very few vendors offer a network operating system that supports the Unix environment.

Unix pluses

Doyle noted that Unix-based nets have several key advantages over existing MS-DOS- and OS/2-based network operating systems. Unix offers advanced security features and built-in wide-area network interfaces, Doyle said.

Personal computer users on local nets will receive the advantages of Unix while working with the easier to use interfaces of network operating systems such as NetWare or LAN Manager.

"Whether it's Banyan's VINES, Portable NetWare or the LAN Manager version of Unix, the Unix operating system kernel will be hidden from the user by the various interfaces," Doyle explained. "Users will get all the networking functions without the complexity of Unix itself."

Unix-based network operating systems will initially be embraced by users in the scientific and engineering communities, which have been Unix's earliest and staunchest supporters, Doyle said.

3Com packages LAN as mini alternative

continued from page 23

client-server strategy.

Ashton-Tate Corp., Oracle Corp., GUPTA Technologies, Inc. and Borland International, Inc. demonstrated their respective SQL data base servers running on a 3+Open CSS network. Microsoft Corp.'s Excel spreadsheet was shown acting as a front end to the Ashton-Tate/Microsoft SQL Server, accessing it across the 3+Open network via the Named Pipes interprocess communications facility.

3Com also received software support for CSS from Lotus Development Corp.'s Lotus Notes and Saros, Inc.

The software developers demonstrated that both DOS-based and OS/2 clients can access their data base engines using 3+Open. By contrast, Novell, Inc. now supports OS/2 clients, but not yet DOS clients.

System components

The 3Server/500 has a triple-ported memory architecture that provides different access paths into the memory for different system components so they don't all compete for a single bus. It comes with built-in Ethernet and LocalTalk connections, and several token-ring interfaces are available as options. The system comes with 2M bytes or 8M bytes of memory on its motherboard, and that is expandable to 16M bytes.

The server can accommodate as much as 630M bytes of internal hard-disk storage, and it has a Small Computer System Interface (SCSI) port.

As many as five external memory subsystems can be daisy-chained to the SCSI port, providing as much as 6G bytes of additional storage.

A 3+Open CSS package with one diskless workstation is priced at $19,250 through October and at $21,495 after that; a package with 10 workstations costs $41,925.

The new version of 3+Open, Release 1.1, includes what 3Com refers to as its Demand Protocol Architecture (DPA). Eventually, DPA's Resident Protocol Manager software, which runs in the workstation, will be able to load and unload a host of networking protocols as needed.

Currently, 3+Open's DPA only supports Network Basic I/O System, but a Transmission Control Protocol/Internet Protocol option will be available next month for an additional $1,995 per server license, or $350 for a single-user version that resides on each workstation.

Called 3+Open TCP, the software includes the Berkeley Unix 4.3 Sockets interface and the Bridge Application Programming Interface (BAPI) for DOS. BAPI enables DOS workstations to emulate terminals in a variety of host environments.

3+Open TCP also includes TCP/IP's File Transfer Protocol (FTP) for transferring files among dissimilar systems, Telnet for TCP/IP terminal emulation and 3+Open VT for emulating Digital Equipment Corp.'s VT-52 and VT-100 terminals.

Besides loading and unloading NETBIOS, TCP/IP and other networking protocols, DPA delivers such OS/2 communications facilities as Named Pipes and Mail Slots to DOS clients.

New workstations

3Com also added two new models to its line of Intel Corp. 80286-based diskless network workstations and released the first of a series of X.25 gateway servers that link CSS to public packet nets. It also said a 3+Open Maxess gateway that links DOS workstations on a 3+Open network to a Systems Network Architecture host would be available in October.

The new 3Station/2X is a faster version of the existing 3Station/2E and includes built-in LIM 4.0 expanded memory support. The new 3Station/2ED can function as a regular network node or as a high-resolution terminal to a DEC VAX running VMS or Ultrix, communicating with the host across Ethernet via DEC's Local Area Transport protocol.

The flurry of introductions came in the wake of a losing quarter — one that Krause attributed partly to a paucity of new products. The introductions are "the first piece of good news 3Com has had in a while," Kimball said.

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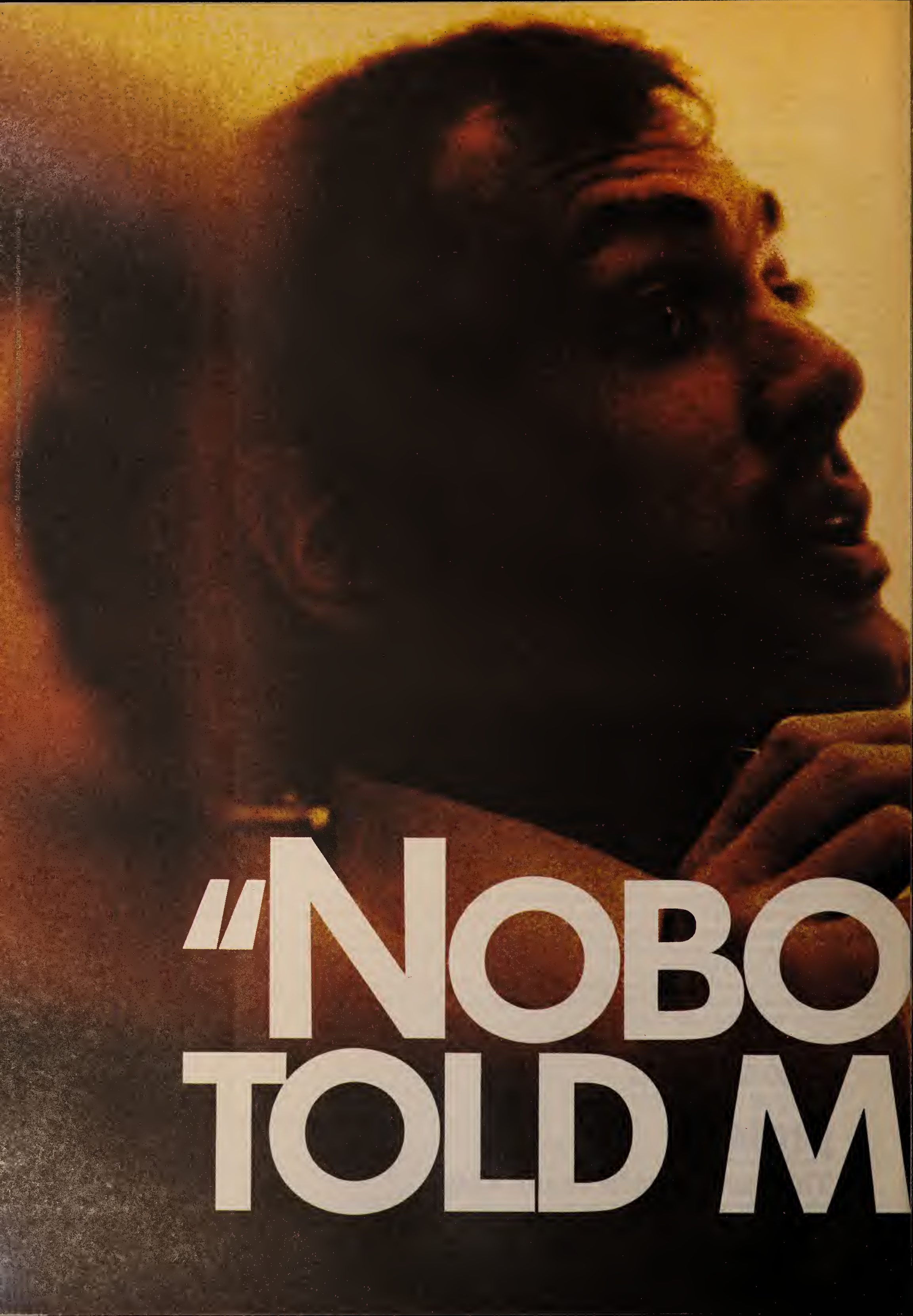
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Netnotes

continued from page 23

Personal System/2. An on-board zero-wait-state memory interface helps alleviate any bottlenecks between the local net and the personal computer.

Western Digital said its new EtherCard Plus16 is software-compatible with Novell, Inc.'s NetWare, Microsoft Corp.'s LAN Manager, Digital Equipment Corp.'s PCSA, Unix System V.3 and the Santa Cruz Operation, Inc.'s SCO Xenix.

EtherCard Plus16 is expected to begin shipping this month; it costs $499.

Gateway Communications, Inc. of Irvine, Calif., last week released a suite of software drivers that enable its Ethernet adapters, and X.25 and Systems Network Architecture gateways to be used in networks based on Microsoft Corp.'s OS/2 LAN Manager.

Gateway, which traditionally has been associated closely with Novell, Inc.'s NetWare, expects the new drivers to broaden its base of potential customers.

Gateway's G/Ethernet adapters, G/SNA Gateway and G/X25 Gateway now come with drivers for LAN Manager, as well as with specific drivers for 3Com Corp.'s 3+Open version and 3+Share.

The drivers are available as a free upgrade to existing G/Ethernet users.

The G/Ethernet boards are available in eight-bit workstation and 16-bit server versions for both industry-standard and Micro Channel personal computers.

Computer Mail Services, Inc. of Southfield, Mich., earlier this month released an electronic mail gateway product enabling users to exchange messages between Banyan Systems, Inc.'s VINES Network Mail and any software supporting the Message Handling System (MHS) in Novell, Inc.'s NetWare.

Developed by Action Technologies, Inc. of Emeryville, Calif., MHS is a store-and-forward mechanism that dissimilar applications can use to exchange messages with one another.

The V-Bridge/MHS gateway consists of two pieces of software. One runs on a DOS-based personal computer that is attached to the Banyan local network and acts as a mail server. This mail server is attached via a modem-to-modem connection to the NetWare network.

The primary portion of the V-Bridge/MHS software resides on a VINES file server. It interacts with VINES's StreetTalk directory service, controlling address processing and all message traffic between the two local networks, the gateway and Banyan Network Mail.

Mail being sent from one local network to the other is addressed either to the actual recipient or to a V-Bridge/MHS nickname representing an actual address.

Pricing depends on the number of VINES servers that can access the V-Bridge/MHS. A three-server license costs $1,495, a 10-server license is priced at $1,995, and a 20-server license costs $2,995.

Communication Machinery Corp. (CMC) of Santa Barbara, Calif., has extended its line of OpenWare Transmission Control Protocol/Internet Protocol software with a version for the Unix operating system running on Intel Corp. 80386-based systems attached to an Ethernet.

With the addition of the new release, OpenWare now provides a common set of networking services to DOS-based systems, VAX/VMS hosts and workstations, and Unix-based personal computers.

These services include an electronic mail system based on the Simple Mail Transfer Protocol (SMTP), support of AT&T's Remote File System, a Telnet remote terminal facility, data exchange via File Transfer Protocol, Berkeley Unix 4.3 remote utilities and a network-naming service.

The highest performance hardware option for the new OpenWare software is the CMC-640 intelligent Ethernet adapter, which lets users off-load the TCP/IP protocol processing from the workstation's 80386 processor.

Bundled together, the adapter and software are priced at $1,255.

Separately, CMC released a new version of its TCP/IP for VMS software that includes NFS support, and it announced that Digital Equipment Corp. had signed a service agreement covering CMC's OpenWare intelligent Ethernet adapters for VAX and MicroVAX II computers. Under the terms of the agreement, DEC representatives can install, support and maintain the CMC products.

We Put The Future Of V.32 Modems On The Desktop.

Photograph: The Bettman Archive.

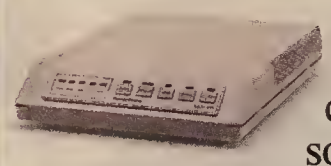
H.G. Wells, English author and futurist, 1866-1946. Author of *The Time Machine, War of the Worlds,* and *Things To Come,* Wells is considered one of the founding fathers of the science fiction genre.

In his science fiction novels, H.G. Wells chronicled his remarkably accurate vision of the future. Racal-Vadic's insight into the future of desktop dial-up communications is far from fiction—it's here, now.

The new 9632VP is the first modem to offer the performance of V.32 in a package tailored specifically for use with corporate PCs. So it has all the dial-up features you need, the ease of use you want, plus a tiny footprint and a price tag to match.

The 9632VP offers error correction (MNP™ classes 2-4) for absolute data integrity. And gives you data compression (MNP class 5) for throughput to 19.2 Kbps. It also features async/sync data handling for application flexibility.

Best of all, the 9632VP communicates freely with your existing modems. It's compatible with all other V.32 modems, and automatically negotiates with CCITT V.22*bis*, V.22, and Bell 212A/103 standards as needed.



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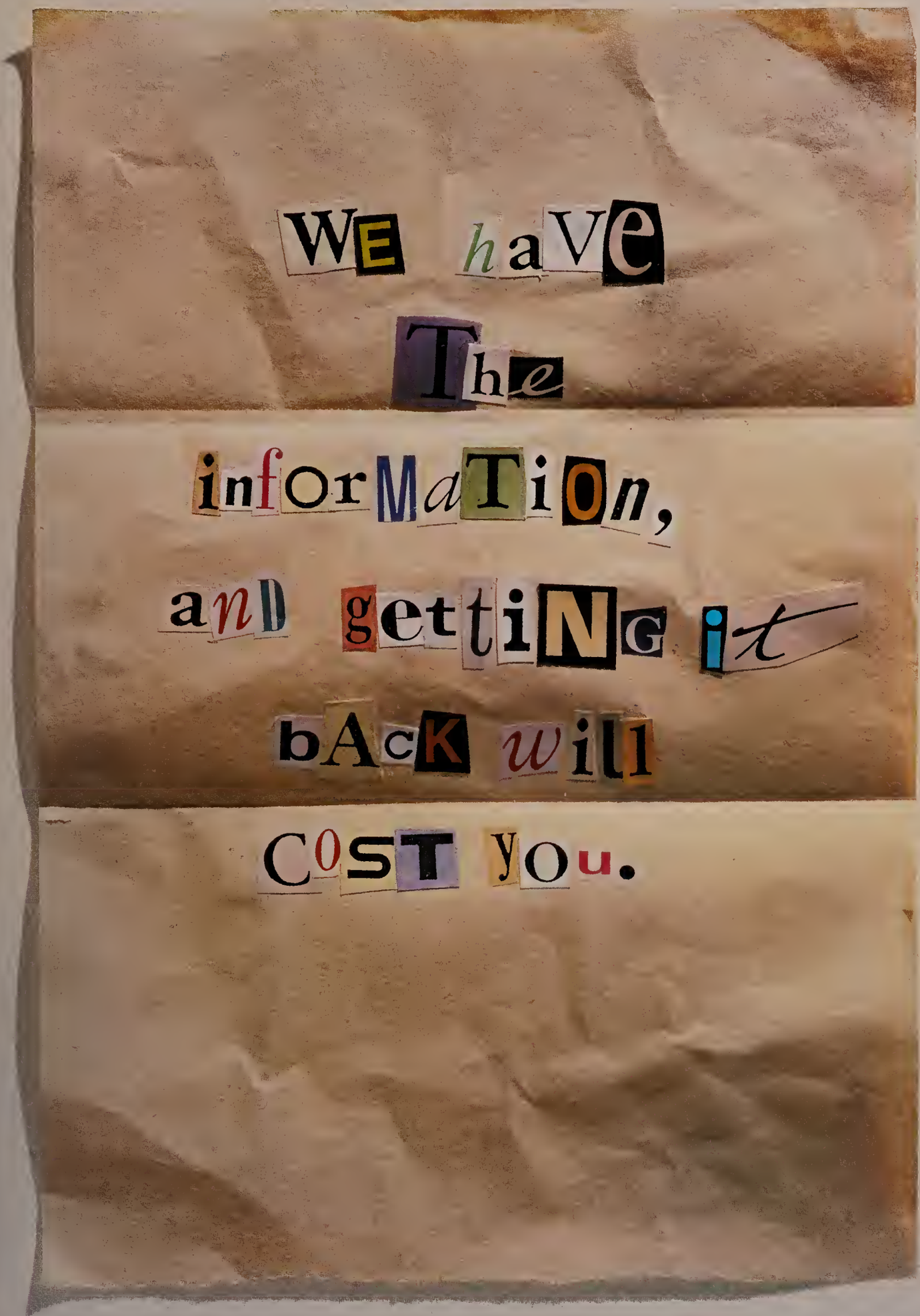
Tiara to unveil desktop diagnostics

continued from page 23

"This is important because it lets network administrators know when and if the network is at peak usage, and it enables them to detect abnormal data transmissions or traffic patterns, and track them to the source," Throckmorton said.

Watson said that while The Network Inspector can be loaded onto any MS-DOS-based IBM Personal Computer AT or Personal System/2, there are certain caveats. Tiara, for instance, recommends that it be installed "on an Intel Corp. 80286-based personal computer with a minimum microprocessor clock speed of 10 MHz when the network administrator uses the software to monitor real-time network traffic usage," Watson said. "This ensures that The Network Inspector can handle the maximum network traffic loads at peak usage times without dropping any data packets."

The Network Inspector software is priced at $1,295 and is scheduled to ship in October. A version of the software for token-ring nets will follow in the fourth quarter, and one for Arcnets will be available in the second quarter of next year.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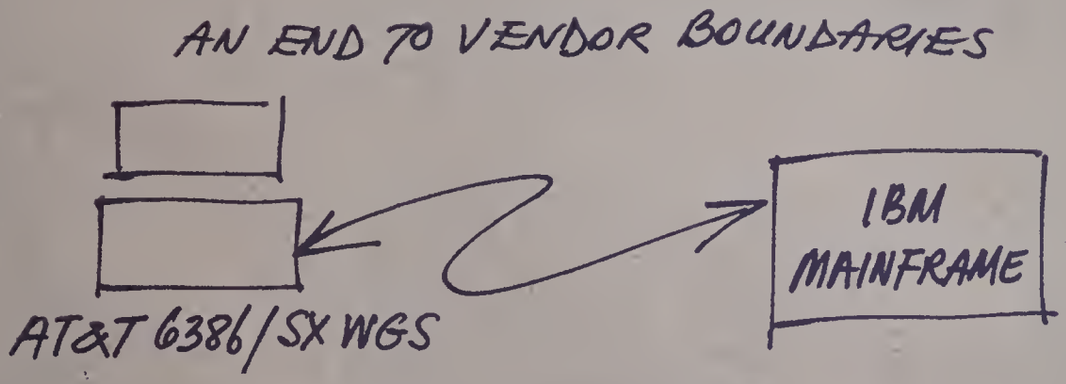

Introducing Four New Networked Computers

Your information systems are supposed to help people make the most of the information they have. But how often do ordinary computers hold up that very information?

We offer a solution: Four new desktop systems and servers designed by AT&T to *thrive* as networked systems.

These are *inter*personal computers. AT&T's new systems (ranging from a simple PC-to-mainframe package to a "connoisseur's" server for mission-critical applications) bring together more than information. They bring together the people behind it.

Meet your other systems. Sharing information among people using different manufacturers' equipment has always been a problem.

Now the solution's as simple as the example in the first drawing above. A new AT&T 6386/SX WorkGroup System links to an existing IBM® host and gives your people access to important corporate data held there.

The key lies in a network builder's oasis called the AT&T Application Operating Environment (AOE). AOE offers a unique collection of industry stan-

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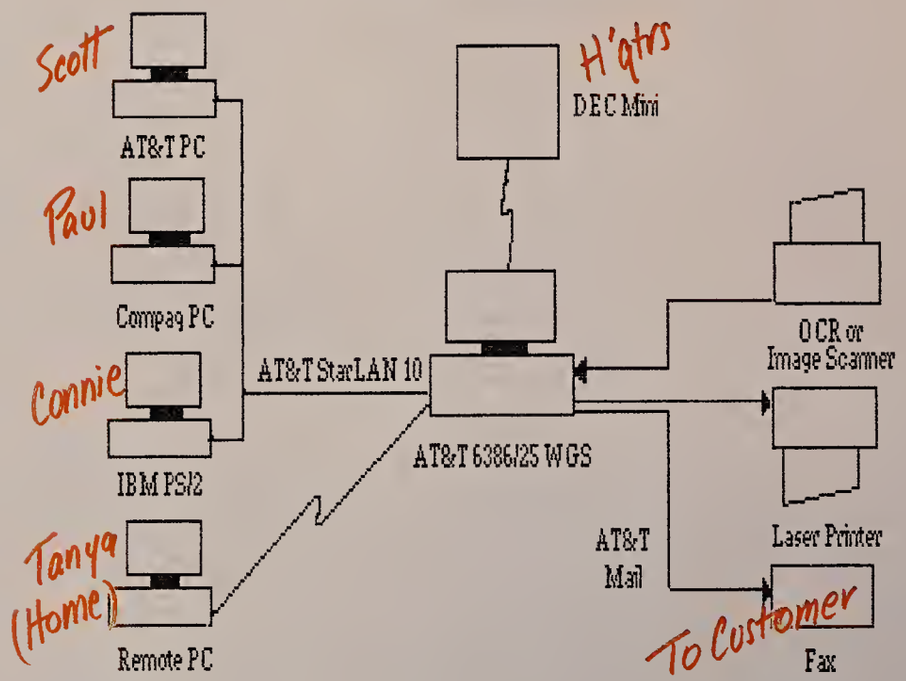
The Networked Co

New applications for old PCs.



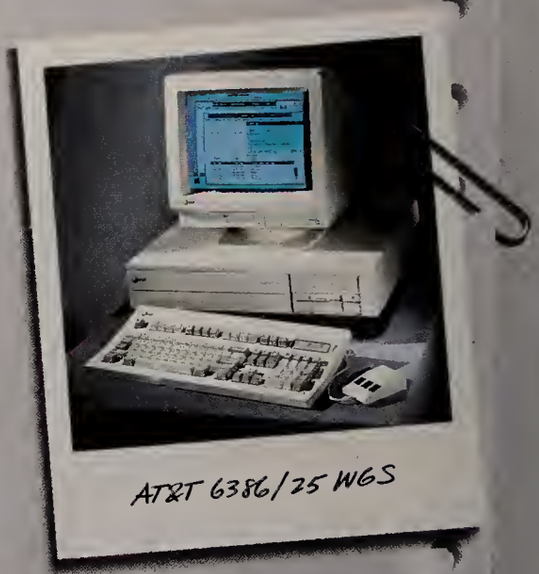
dards (SNA in this case) that let AT&T's new Networked Computers work smoothly with the systems you already have.

How to share new applications and precious resources. Take the case of Scott, Paul, Connie and Tanya in the second diagram. They each rely on expensive peripherals, but you can't afford to get them individual sets. And their complex, networked application would really strain your existing DOS server.

Enter the AT&T 6386/25 WGS, our entry-level UNIX® System V server. UNIX System V is the only desktop operating system *designed* for communication-intensive applications. And since it also supports AT&T's OPEN LOOK™ Graphical User Interface, life can be visibly easier.

We've given the 6386/25 features that exploit the UNIX system's natural ability. So it's perfect for resource-sharing, database management and other applications DOS and OS/2™ just can't handle efficiently.

In fact, AT&T has configured, packaged and tested solutions including communications, database and image servers. Just let us show you.



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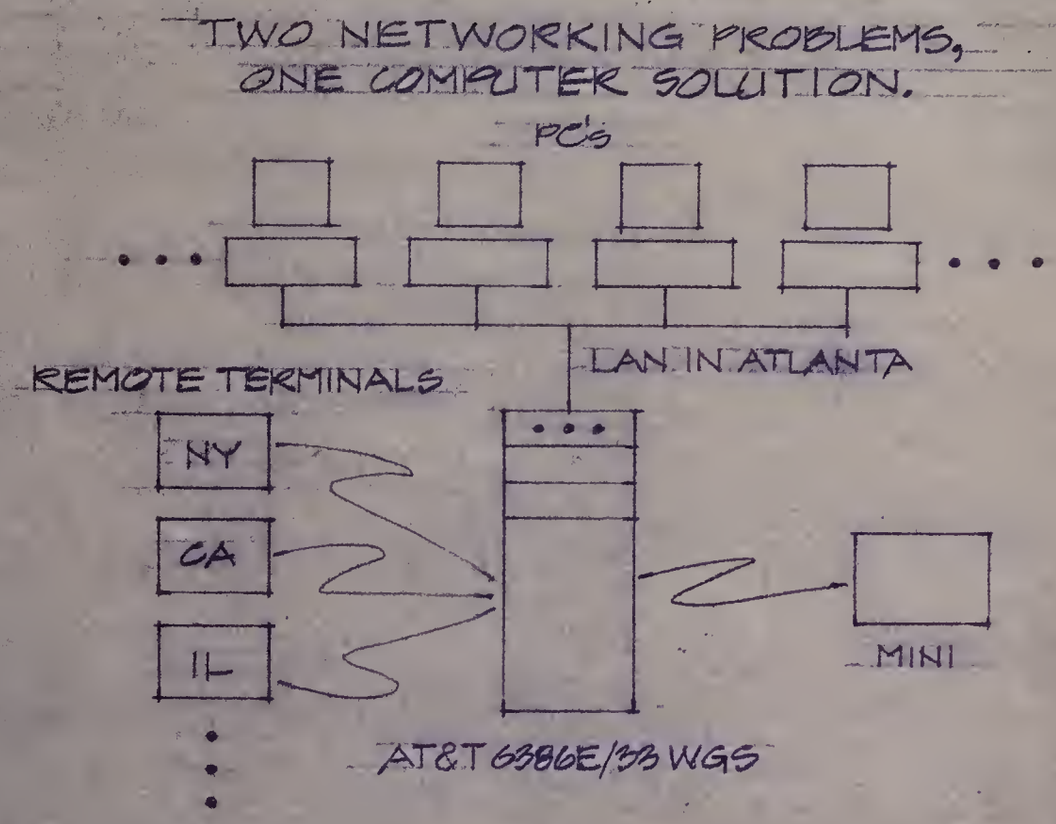


Simultaneous solutions. Chances are you need a server to support information sharing in a local PC network. Fair enough. But here's a Networked Computer that will also manage a nationwide database at the same time.

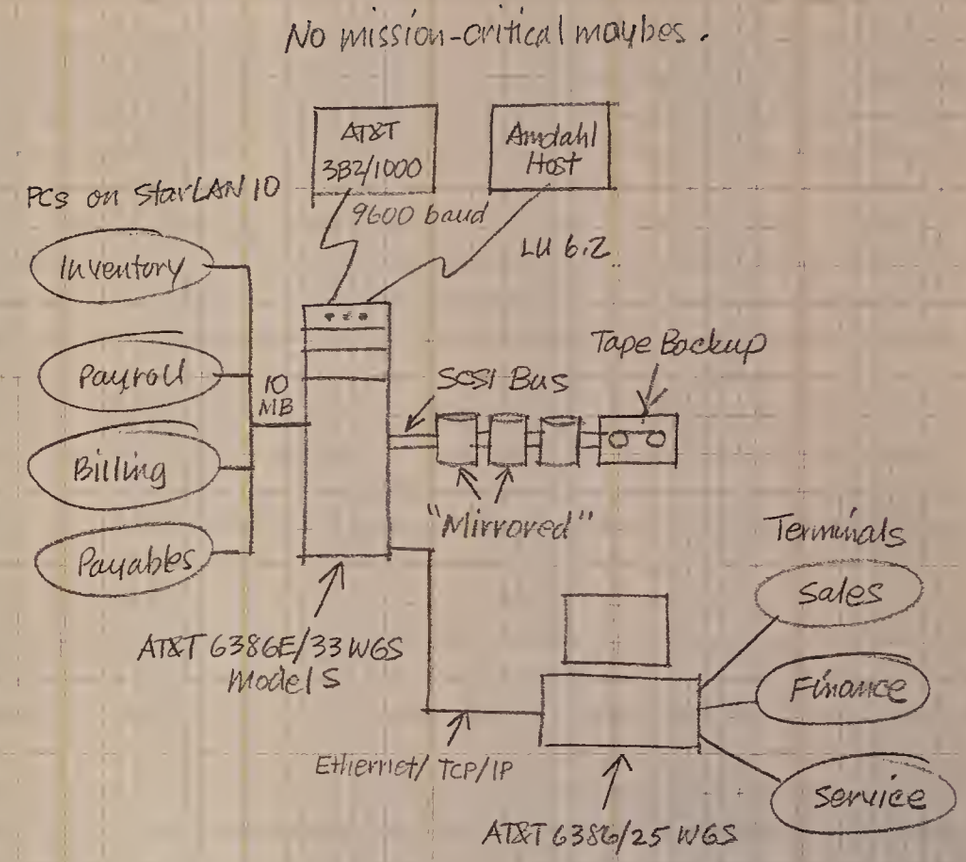
With headquarters in Atlanta, you have people in two dozen offices scattered across the U.S. Because geography makes interoffice agreement difficult, you feel more like twenty-five little companies than one big one.

In Atlanta, put 600 MB of data into the disk space of an AT&T 6386E/33 WGS. Place asynch terminals in your field offices, and connect them directly to the 6386E/33 WGS. Suddenly, everyone's working with the same numbers, the same names, everything. Which, at about 7.7 MIPS, is power that would make some mainframes blush.

Now, shift into high gear by connecting the PC LAN you already have in Atlanta. We provide the systems and expertise you need to support LAN *and* remote terminal applications at the same time.

And for mission-critical Networked Computing, our solution is the AT&T 6386E/33 WGS Model S. It shines in networks like the one shown in the final diagram—where every bit

*One-year, on-site warranty.

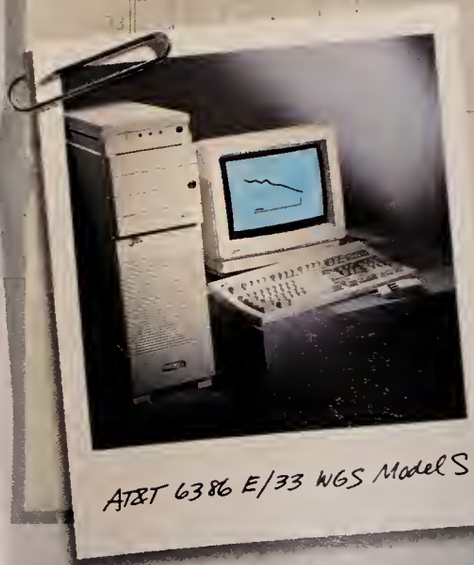


of information from people in one department can trigger action by people in another.

To protect all that information, we include a special "disk mirroring" feature that performs automatic, instantaneous backups. And since the Model S comes with SCSI, you get seven times more storage than non-SCSI 386 products.

On top of that, we test and warrant* each element of the package, then assemble the complete system, including SCSI devices, UNIX System V operating system, StarLAN 10 networking hardware, and StarGROUP™ software.

Let's talk. You'll find the Networked Computing experts make good listeners. We can customize, install and integrate the Networked Computers in as many different ways as you have needs. To learn more, simply call your AT&T Authorized Reseller or AT&T Account Executive. Or just turn the page.



AT&T 6386 E/33 WGS Model S

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Draw or explain it below, and then Fax it to us at **1 800 833-6386,** and a sales representative will call you. Or call your AT&T Authorized Reseller, AT&T Account Executive, or **1 800 247-1212, Ext. 162,** for more information.

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Worth Noting

The Transportation Data Coordinating Committee/Electronic Data Interchange Association recently announced that it has commissioned a study of the impact of the EDI For Administration, Commerce and Trade standard on EDI in North America. Study results will be presented in December at the 21st National EDI Systems Conference and Exhibit in Washington, D.C.

Association Watch

The Board of Directors of the **International Communications Association (ICA)** has named Robert Eilers as the users group's executive director.

Formerly, Eilers was the ICA's director of publications and press relations, a position he has held since April 1986. In that post, Eilers worked as managing editor of the ICA's bimonthly magazine *Communique*. Eilers replaces Robert Kingsbury, who resigned as ICA executive director.

Users of equipment from Fremont, Calif.-based Vitalink Communications Corp. plan to hold the second **Vitalink User Exchange** conference Sept. 20 to 22, in San Diego.

The first Vitalink User Exchange was held in April. The meetings are designed to provide an open forum where Vitalink users can exchange information with the company.

Slated at the first meeting are presentations from users at Dow Chemical Co., The Boeing Co. and E.I. du Pont de Nemours & Co., Inc. Also speaking will be Vitalink executives. The cost of the meeting is $250.

For more information, contact Jim McCabe, president of the Vitalink User Exchange, at (415) 794-1100.

Financial firms team up in disaster recovery plan

Rivals ally to restore voice service in an emergency.

By Wayne Eckerson
Staff Writer

MINNEAPOLIS — Four competing financial services firms here have teamed up in an innovative disaster recovery program.

The companies have agreed to share capacity on their private branch exchanges if a switch at any one of the firms goes down for an extended period.

As part of the plan, the companies jointly lease telecommunications equipment that would be used during an outage, and they participate in periodic tests of the disaster recovery procedure.

The plan ensures that the users will not lose vital telephone service for an extended period of time due to an on-site switch problem, and it saves them the cost of supporting a redundant switch. The financial services firms depend directly on their phones to conduct most of their business.

"There's no way any of us could afford to install and maintain a redundant switch on-site. We're working together for the common good of all," said Keith Moberg, associate vice-president of telecommunications at Dain Bosworth, Inc., one of the four firms participating in the plan.

While all the firms are located within blocks of one another in downtown Minneapolis and compete for many of the same customers, Moberg said they realized the plan was in their mutual best interests.

He added, "An agreement like this could never happen in New York or Los Angeles, only in the friendly Midwest."

The agreement took shape four years ago when telecommunications managers from Dain Bosworth, First National Bank of Minneapolis, IDS Financial Corp. and Piper, Jaffray and Hopwood, Inc. decided to form an association, which they called Mutual Assistance Pact, to share resources and form a joint disaster recovery plan.

The association took advantage of excess capacity on an existing T-1 network that connects the buildings where the firms are located. The T-1 links run inside skywalks among office buildings in downtown Minneapolis. The Mutual Assistance Pact committee is currently considering using Northwestern Bell Telephone Co.'s downtown fiber ring to pro-

(continued on page 32)

EXECUTIVE BRIEFS

BY BARTON CROCKETT AND WAYNE ECKERSON

Telecom paradise. Looking for the ideal place to set up a network? Consider Multi-Function Polis (MFP), Australia.

MFP is the working name given to a high-tech city of the future that the governments of Australia and Japan are considering building somewhere near a major Australian city. The exact location has yet to be set.

In fact, little has been decided about MFP, except that both governments and about 170 private companies have agreed to give Chicago-based Arthur Andersen & Co. and Adelaide, Australia-based Kinhill Engineers Partnership, Ltd. about $3.2 million to study the feasibility of the project. The study is expected to be finished this December.

As currently conceived, MFP will feature the world's most sophisticated network technologies, according to Neil McDermott, Arthur Anderson's senior manager for the project.

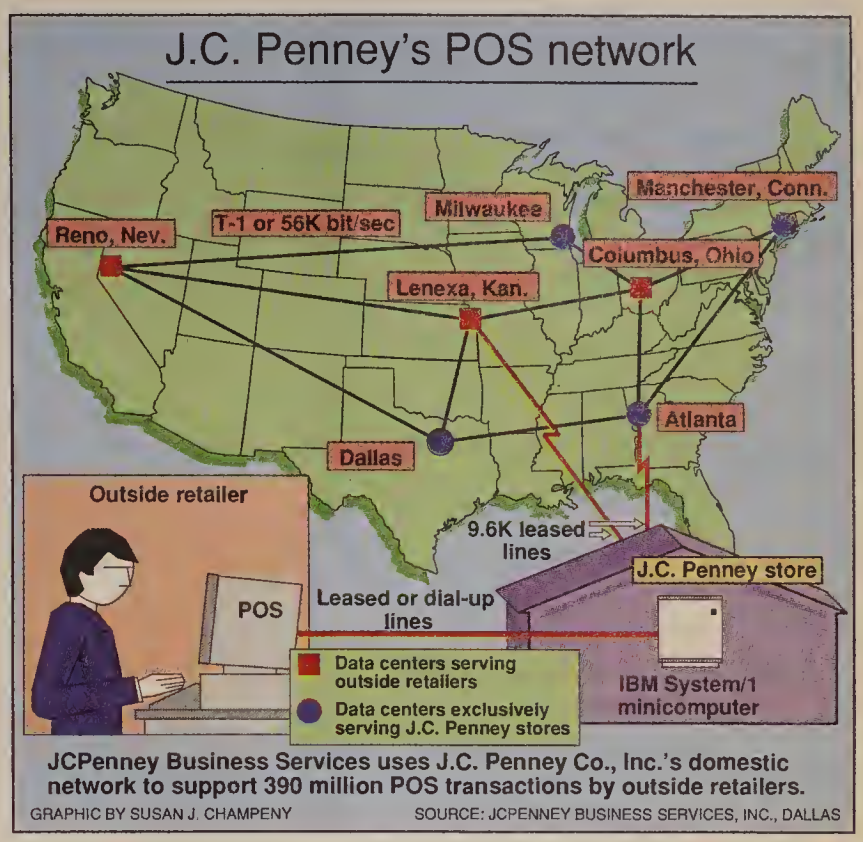
Included will be advanced central office switches, Integrated Services Digital Network and a fully fiber-optic telecommunications network, with fiber running into homes.

MFP is expected to have a population of between 20,000 and 40,000 people, and it will be a suburb of a major Australian city.

One of the goals of the project will be to turn whatever Australian city MFP is near into one of the world's major communications hubs, on par with London, New York and Tokyo.

"We want major companies to be running their international networks through here and to gain a competitive advantage from doing so," McDermott said.

(continued on page 33)



JCPenney Business Services uses J.C. Penney Co., Inc.'s domestic network to support 390 million POS transactions by outside retailers.

GRAPHIC BY SUSAN J. CHAMPENY SOURCE: JCPENNEY BUSINESS SERVICES, INC., DALLAS

J.C. Penney shines in role as vendor

User capitalizes on retailing expertise, large net to sell services tailored to other stores' needs.

By Wayne Eckerson
Staff Writer

DALLAS — J.C. Penney Co., Inc. is a classic story of a network user turned network vendor.

In 1983, executives at the retail giant saw an opportunity to enter the rapidly growing market for third-party network services. The executives believed they could capitalize on J.C. Penney's retailing expertise and its sprawling domestic network in offering network services tailored to other retailers.

The company created a wholly owned subsidiary called JCPenney Systems Services, Inc., which was later merged with JCPenney's Credit Services, Inc. to form JCPenney Business Services, Inc., based here.

Opportunity knocked

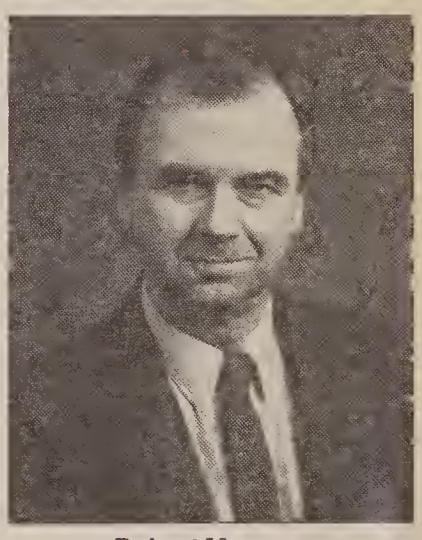
"We saw an opportunity to use our network know-how and make a profit without a lot of risk up front," said Bob Mooney, president of JCPenney Business Services.

JCPenney Business Services offers a variety of services, including credit authorization, credit and debit card settlements, and billing and processing for retailers with their own credit cards.

It also captures and delivers point-of-sale information, such as price, quantity and product type, to customer-specified third-party credit processors.

Company officials declined to release revenue or profit figures, but they said the subsidiary has grown steadily since it was formed and "contributes profitably" to its parent company.

JCPenney Business Services handles more than 390 million point-of-sale transactions and is the fourth largest third-party POS service provider in the country, according to a recent study by "Credit Card News," a Chicago-based newsletter.



Robert Mooney

The company is also the largest supplier of POS services to the retail petroleum industry, according to company officials.

JCPenney Business Services supports 19,000 POS terminals located in hundreds of gas stations and convenience and chain stores throughout the country.

All credit processing is handled by J.C. Penney's domestic network, which also provides network services to J.C. Penney's approximately 1,400 nationwide stores (see graphic, this page).

The Business Services subsidiary has become so successful

(continued on page 33)

Singapore readies national EDI network for health organizations

Net designed to help health care workers cut down paperwork.

By William Dennis
Computerworld Southeast Asia

SINGAPORE — Singapore is expected to become the first country in Asia, as well as one of the first in the world, to implement a national electronic data interchange network for medical and health institutions.

The network, scheduled to be operational by December 1991, will link medical and health organizations including the Ministry of Health, the Ministry of Labor, the Central Provident Fund Board (CPFB) and the Ministry of Environment.

Organizations involved in Medinet will be able to transmit purchase orders, invoices and delivery orders for drugs and medical supplies; access local and foreign information services; and exchange patient data. Hospitals and clinics will also be able to submit billing information to government agencies.

"Medinet is aimed at enabling health care professionals to spend less time on paperwork and more time on patients, thereby improving the productivity of the health care industry and helping to contain the spiraling costs of health care in the country," said Koh Siew Hoon, a senior industry officer at the National Computer Board (NCB).

Medinet is a joint effort between the Ministry of Health and the NCB. Hoon added that a study of the requirements and costs of the project will be finalized at the end of October.

"One thing for sure is that the institutions concerned will only have access to information that is relevant to them. For example, hospitals linking to CPFB will only be able to verify a patient's Medisave [a provident fund for health care] account," she said.

Users will pay for the service, but the rates and how they are to be charged have not been decided.

Another medical information system, MediStat, was launched in July 1988 to support the exchange of statistics on medicine and health. It is provided at no cost by the National University of Singapore's Department of Community, Occupational and Family Medicine.

> Users will pay, but the rates have not been decided.
>
> ▲▲▲

Financial firms team up in disaster plan

continued from page 31

vide the interconnections needed to support the disaster recovery plan.

In addition, the firms use identical PBXs — Northern Telecom, Inc.'s SL-1s — and employ the same vendor to maintain and service their telecommunications equipment.

The companies came up with a recovery plan that calls for voice traffic to be rerouted around a downed switch within eight hours. Each firm has agreed to reserve enough capacity on its switch to support 300 additional phone lines. When a switch goes down, the committee quickly designates one of the three remaining companies to act as a host switch.

Remote peripheral equipment is then delivered to the downed site and to the site with the new host switch by the firms' service company, Collins Communications Systems Co. of St. Paul, Minn., which stores and maintains the equipment. The equipment consists of small switching cabinets containing line and station cards, and patch panels. The equipment, which is linked over the T-1 network, allows a host switch to support phone communications in a remote site. Technicians use portable cellular telephones to communicate with one another when setting up and testing the connections.

Meanwhile, the committee instructs Northwestern Bell to activate 300 telephone numbers that the firms have reserved for use in a disaster. Northwestern Bell substitutes the activated numbers for numbers used by the company whose switch has been knocked out. Incoming calls are automatically sent to the new host switch, which routes the calls to the other firm, bypassing the downed switch.

In the four years of the association's existence, the disaster recovery plan has never been used in a real disaster, although there have been several close calls, Dain Bosworth's Moberg said. The plan is only initiated if the downed switch can't be restored in less than eight hours. The group relies on technicians from Collins Communications to determine whether the switch can be restored quickly or whether the recovery plan should be initiated.

Several other area companies have expressed interest in joining the group, Moberg said, but so far, it has declined to expand its membership.

"At this point, adding more companies would reduce our protection. There would be a greater likelihood that the equipment would be tied up when you needed it," Moberg said.

Life In The Fast LAN.

Want to see how fast our LAN boards are?
Want to see it again?
We're talking about our hot new 16-bit EtherCard PLUS16™ board. A board far, far faster than any 8-bit boards. Even faster than our own blinding fast 8-bit boards. And that's fast. Because of this awesome speed, we have higher throughput than any others currently on the market. In fact, higher throughput than any others currently in the galaxy.

With EtherCard PLUS16, your Ethernet network will suddenly become more productive. And (if you'll pardon the use of a phrase seen in virtually every computer industry ad since the introduction of ENIAC), you'll get better price-performance from your system.

Of course, we didn't just whip out our new EtherCard PLUS16 over the weekend. It's actually the latest in a long line of network hits that includes our much-heralded and top-rated 8-bit EtherCard PLUS™ and TokenCard™ boards. Boards, as you might expect, with higher throughput than run-of-the-mill competitive 8-bit boards.

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J.C. Penney shines in role as vendor

continued from page 31

that the network now handles twice as many transactions from outside retailers as it does from J.C. Penney's own stores. The subsidiary's customers include such giants as Citgo Petroleum Corp., Shell Oil Co. and Amoco Corp.

Last month, JCPenney Business Services added the first auto parts supply dealer to its growing customer list when it signed a five-year contract to provide POS services for General Automotive, Inc.

Under the contract, JCPenney Business Services will provide POS credit authorization, data collection and full credit card processing and settlement services for retail stores owned by the Seattle-based automotive parts distributor.

"Many large retailers prefer having us provide and manage their POS network so they can focus on their core businesses," Mooney said.

POS network and services

J.C. Penney maintains six major data centers linked by multiple T-1 and 56K bit/sec lines. Three of these data centers — in Reno, Nev., Lenexa, Kan., and Columbus, Ohio — process transactions for JCPenney Business Services accounts.

Each of the six data centers houses multiple IBM 3081 mainframes and Tandem Computers, Inc. NonStop TXP minicomputers. These processors are linked via 9.6K bit/sec leased lines to IBM Series/1 minicomputers in 650 J.C. Penney stores.

To get onto the network, retailers access the nearest Series/1 via leased or dial-up lines, depending on traffic volume.

Credit authorization requests pass from the retailer's POS terminal through the J.C. Penney network to an IBM mainframe at a data center. The mainframe checks whether a customer's card is stolen, missing or delinquent.

The network also captures sales information on every POS transaction done at retailers' stores. For customer charges made to proprietary credit cards, the network collects the data and sends it to the retailer's central billing center or a designated third-party processor.

For nationally recognized bank cards, JCPenney Business Services maintains direct links from its data centers to Visa USA, Inc. and MasterCard International, Inc. data centers. Using JCPenney National Bank in Harrington, Del., or a bank chosen by customers, JCPenney Business Services is able to pay retailers for customer charges made on these cards.

This accelerates the availability of funds and improves retailers' cash flow. IBM 3083 mainframes at the six network data centers process the settlements.

Ties to 40 banks

The network also has connections with 40 bank networks to settle charges on bank debit cards. These cards automatically debit a customer's bank account for the amount of the sale.

JCPenney Business Services can also act as a third-party processor to handle billing, mailing, collection and remittances for transactions made on a retailer's proprietary credit card.

Executive Briefs

continued from page 31

McDermott said Australia will present MFP as a major backup node should earthquakes knock out fiber-optic cables linking Japan and North America.

McDermott added that MFP will become a test bed for new technologies and network services.

"The network will be so advanced that switch makers, for example, [will] want to use it to test new features," he said.

The city will also feature top-flight academic and research facilities, state-of-the-art hazardous waste disposal technologies and ultramodern vacation resorts.

A final decision on whether or not to build MFP will be made after the report is completed and will be based primarily on private investor interest in the project, McDermott said.

Public speaking made simple.

If you spend weeks getting ready for a speech, you're probably working too hard and undermining the effectiveness of your presentation, according to Robert Flax, president of Motivational Systems, a management training and consulting company in West Orange, N.J.

Flax says the best public speeches are spontaneous; speeches that are read or memorized from a script or extensive notes have far less impact.

And the key to giving spontaneous speeches?

Flax says it's thorough knowledge of the subject, self-confidence and an assured manner of delivery.

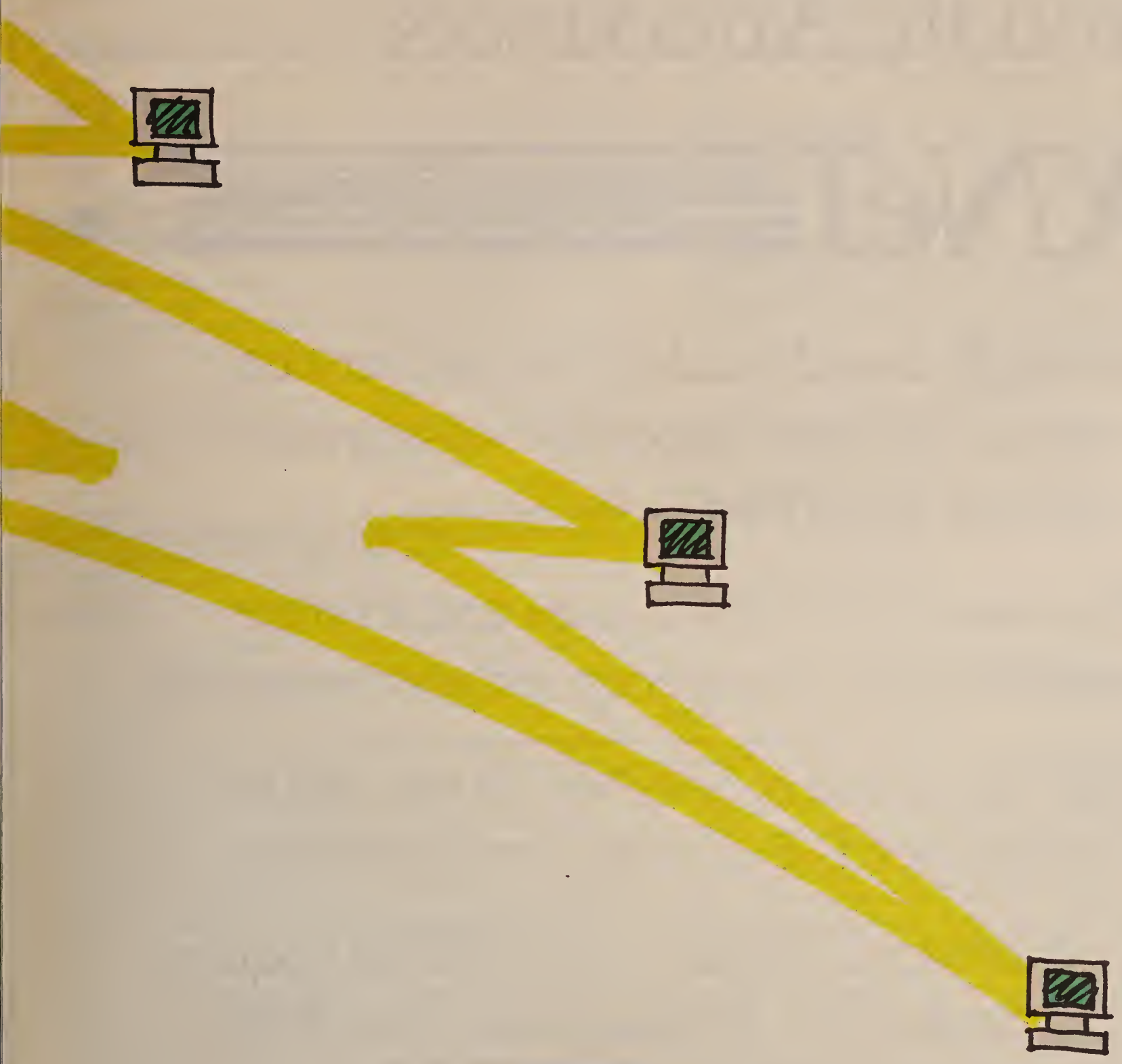
Most people underestimate their ability to deliver a speech in a confident, persuasive manner.

Flax says that when people are shown videotapes of themselves speaking, they are usually pleasantly suprised at how self-assured they appear.

Other tips from Flax include:

- Instead of using detailed notes during a speech, use one- to three-word "triggers." These are key words or concepts designed to spark the next train of thought.
- Avoid putting your hands in your pockets or behind your back. Keep them in front where they can gesture naturally.
- Establish eye contact with people one at a time. Don't look at the wall.
- Structure the speech simply:

Start with a 15- to 30-second "grabber," a story or joke that illustrates the purpose of the presentation. Then provide facts and details to support the introduction, using no more than five triggers. End the speech by recommending action the audience can take.



But we're far from impartial. So don't just take our word on something this important.

Instead, take the word of those with no incentive to make outrageous claims. Like product reviews taken straight from the pages of trade pubs whose editors are rivaled in their honesty and purity only by Snow White.

For example, Electronic Buyers' News named EtherCard PLUS the Best Add-In Board for 1988. LAN Magazine named it the Product of the Year. And PC Digest named it winner of its highest overall rating.

Naturally, all Western Digital Ethernet and Token Ring products are compatible with Novell NetWare and work lightning fast in all environments.

So if you're looking for value in network boards, visit your nearest dealer and look for the ones named most often by the trade pubs. Look for the ones named Western Digital.

THE LAN FORMS HERE

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For details on *Network World's* new FAXNeT inquiry service, and the September 25 inaugural issue, FAX Paul McPherson at 508-879-3167.

September 25 issue closes September 13.

NETWORK WORLD

An IDG Publication

PRODUCTS & SERVICES

THE LATEST OFFERINGS FROM VENDORS AND CARRIERS

Worth Noting

See inside for:

- Two multiprocessor computers from Data Voice Solutions that support NetWare.
- Simpact's new E-mail security product for PCs on Novell local nets.

First Look

Emulex's TCP/IP terminal server bows

Emulex Corp. recently announced a high-performance Transmission Control Protocol/Internet Protocol terminal server that supports as many as 32 serial ports and one parallel printer port. The **Performance 4000-T** has 16 RS-232 serial ports and a parallel printer port but can be expanded to support 32 RS-232 ports by attaching a 16-port expansion unit. The 16-port terminal server supports throughput rates of 38.4K bit/sec.

The terminal server provides diagnostic information on an LCD display and has command-line editing and an extended help system. The unit also supports security passwords on each port as well as passwords for a variety of other communications functions. The Performace 4000-T has an internal table that contains node names and other network information and statistics.

The Performance 4000-T one-port configuration is priced at $3,900, and the 16-port expansion unit costs $2,185. The products are available now.

Emulex Corp., 3545 Harbor Blvd., P.O. Box 6735, Costa Mesa, Calif. 92626; (714) 662-5600.

PC pack lets users get E-mail messages

Consumers Software, Inc. last week introduced software that enables remote personal computer users to retrieve electronic mail from local net-

(continued on page 37)

Telenetics net control system bows

By Jim Brown
Senior Editor

ANAHEIM, Calif. — Telenetics Corp. recently unveiled a network management system that can be used to control a variety of vendors' modems and multiplexers.

The microcomputer-based Telenetics Network Management (TNM) system detects faulty communications devices and lines and enables users to take the equipment out of service for repair.

TNM includes Intercept Connectors, small devices with RS-232 interfaces on either end and an RJ-11 or RJ-12 telephone-type modular jack on top. The connectors are installed between data terminal equipment and data communications equipment such as modems and multiplexers.

The connectors intercept RS-232 signals, such as request to send, clear to send and ringing indicator, and then transmit the information via twisted pair to a patch panel with 72 RJ-11 ports or a punch-down patch pannel supporting as many as 96 four-wire devices.

MUM's the word

The patch panels are linked to Modem Use Monitors (MUM) by cables comprised of 25 twisted pairs. The MUMs, each supporting 10 of the 25-pair cables, interpret the RS-232 signaling data and pass it to a microcomputer running Telenetics' Network Windows software. As many as four MUMs can be linked in a daisy chain making a TNM system capable of monitoring up to 960 devices.

> A nonanswering modem can be taken out of operation, enabling subsequent incoming calls to go to the next modem in rotation.
>
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In order to control communications devices from the TNM console, users must have a twisted-pair line to carry control commands from the MUM back to the device. This means each communications device takes up two patch panel ports — one used for forwarding RS-232 signals to the microcomputer and another for forwarding control commands from the microcomputer to the device.

Network Windows software runs on an IBM Personal Computer or compatible with color monitor, 512K bytes of random-access memory, two floppy disk drives, a hard disk and DOS 2.0 or higher. The software displays screens that depict network utilization, fault monitoring, alerts and historical data.

The TNM system can be used, for example, by customers with racks of dial-up modems that answer incoming calls in rotation. A faulty modem can paralyze the rack by blocking rotation. A TNM operator detecting a modem that is not answering can take the device out of operation, enabling subsequent incoming calls to go to the next modem in rotation.

> The security module verifies the password and either lets the user establish a connection or breaks the connection and dials back the user.
>
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The TNM system is also capable of configuring remote Telenetics TC921 CCITT V.32-compatible modems that support a new security module. The module includes 32K bytes of RAM that are capable of supporting up to 400 different passwords and telephone numbers.

Users calling into a TC921 are asked for a password. The security module verifies the password and can either let the remote user establish a connection to a local host or break the connection and dial back the user.

The TC921 transmits asynchronous or synchronous data in full duplex at 9.6K bit/sec. The TC921 supports Microcom Corp.'s Microcom Network Protocol Class 5 data compression, which enables it to achieve 19.2K bit/sec throughput under optimal line conditions.

Pricing

The security and remote configuration module, which users can add to existing TC921s, costs $595. The TC921 modem is priced at $995.

A typical TNM system capable of monitoring and controlling 48 modems costs $6,800.

Telenetics can be reached by writing to 5109 E. La Palma Ave., Anaheim, Calif. 92807, or by calling (714) 779-2766.

Siemens introduces new hybrid switch

Expandable key system/PBX supports T-1; firm also unveils digital phones, attendant console.

By Tom Smith
New Products Editor

BOCA RATON, Fla. — Siemens Information Systems, Inc. and its subsidiary, Tel Plus Communications, Inc., recently announced a hybrid key system/private branch exchange that supports up to 192 trunks and 384 stations.

In its smallest configuration, HCM 200 consists of a single modular cell that supports up to 64 ports. A user can expand the system by adding as many as five cells.

Siemens and Tel Plus also announced a family of digital telephones, the set 400, including 12-, 16- and 24-button models, as well as attendant console and button expansion units.

HCM 200

A base cabinet for HCM 200 contains one module, designated Cell 0, which houses the switching matrix, digital processor and signal interface unit, according to Harvey Kaufman, vice-president of product management for Tel Plus.

Each additional cell can accommodate up to 10 interface cards, but the power supply required for every two cells takes up two slots, so every second cell can support only eight cards. Each slot in a given cell can accommodate a line interface board with up to 24 ports, which would be required for a T-1 trunk line, Kaufman said. The system supports up to six T-1 trunks.

Other available interfaces include an eight-port digital card, a 16-port analog card and a four-port tie-line card.

The company also offers data interface modules that support intraswitch data transmission at asynchronous speeds up to 19.2K bit/sec and synchronous speeds up to 64K bit/sec, Kaufman said.

Standard features of HCM 200 include a nonblocking architecture, least-cost routing, the ability to analyze up to 18 digits for selective call blocking, station

(continued on page 36)

Voice commands activate Kurzweil's fax capability

By Tom Smith
New Products Editor

WALTHAM, Mass. — Kurzweil Applied Intelligence, Inc. recently introduced a product that enables doctors to use voice commands to initiate the facsimile transmission of reports generated on the company's speech recognition computers.

VoiceFAX is an add-on board and software for Kurzweil's VoiceMED line of speech recognition systems — microcomputer-based systems used by doctors at over 200 installations to generate, edit and print reports using voice commands.

Doctors can complete reports by using trigger phrases that call on the system's knowledge base or by using vocabulary programmed into the system.

With VoiceFAX, doctors can use voice commands to transmit reports. Saying "Send VoiceFAX" will prompt a list of referring physicians or departments to appear on the personal computer screen. Speaking the name of the recipient will initiate transmission.

VoiceFAX can send to any Group III fax machine, and multiple recipients can receive the same report by programming their numbers as a single destination, said Mabyn Martin, director of product management. It will also redial busy numbers. Regardless of whether the call is completed on the first try, the user can start the next report after the recipient's name is spoken.

Fax vs. verbal

"The nice thing with this product is that the referring physician doesn't have to do anything to obtain a report," Martin said. "The fax just comes in, and it's a hard copy of a report, which is better than a verbal report."

Each VoiceMED system contains a knowledge base that recognizes certain trigger words and responds by translating a medical term and asking for a more detailed description of the condition.

For example, a radiologist might speak the trigger phrase "cardiomegaly," prompting the knowledge base to respond on

(continued on page 37)

Tool controls Paradyne, AT&T DSUs

By Tom Smith
New Products Editor

LARGO, Fla. — AT&T Paradyne recently enhanced its Master Shared Diagnostic Unit (MSDU), which is used to control AT&T Dataphone II 2600 data service units (DSU), to bring it under Paradyne's Analysis 6510 Network Management System.

The Analysis 6510, which supports Paradyne's 3056 Basic Service Unit through a direct connection, now supports AT&T Dataphone II 2656 and 2696 DSUs. Users can manage both DSU product lines with the same system.

The previous version of the MSDU was controlled by the AT&T Dataphone II Level IV System Controller network management system.

Step toward integration

"This is one step in integrating the product lines of AT&T and Paradyne," according to Rob Ennis, marketing product manager for AT&T Paradyne, based here. AT&T purchased Paradyne in late 1988.

The new MSDU fits into a DSU rack and provides an interface between the Analysis 6510 and as many as 32 DSUs.

Dataphone II 2600 DSUs were previously supported over the Dataphone II Level IV System Controller in the same fashion.

The 3056 Basic Service Unit supports digital transmission speeds of 2,400, 4.8K and 9.6K bit/sec as well as 56K bit/sec. The 2656 supports transmission at 19.2K, 56K and 64K bit/sec, while the model 2696 supports transmission at 2,400, 4.8K and 9.6K bit/sec.

Performance monitoring

Users can now monitor the performance of AT&T and Paradyne DSUs from a single Analysis 6510 console. For example, failure of a DSU line would prompt an alarm to Analysis 6510, and that alarm could be displayed at the console or on a printer. Monitoring functions also include the ability to run loop-back and bit-error rate tests.

Analysis 6510-compatible MSDUs are available now. They cost $500 each.

AT&T Paradyne can be reached by writing to P.O. Box 2826, Largo, Fla. 34649, or by calling (800) 482-3333.

Siemens intros hybrid switch

continued from page 35

message detail recording and analysis, and flexible hunting arrangements, which enable users to prearrange the routing of calls within the system.

HCM 200 has single-pair wiring requirements for both voice and data. It also supports Siemens' Euroset Plus analog phones.

Intelligent phone sets

The three models of the new Series 400 phones have eight preprogrammed buttons dedicated to features such as hold, transfer and speakerphone. All models come equipped with a speakerphone and two-color button lamps for clear-line status indication.

The phones can also be equipped with a "hot dial pad," which enables users to program direct connections to other stations into their dial pad.

Included with the 16- and 24-button models is a text-messaging capability so users can leave messages for in-house callers. The eight standard text messages include, "In conference until . . . " and "Lunch until . . . " Eight additional customized messages can be programmed into the phones.

Other features of the 16- and 24-button models are a two-line LCD display providing information including name and number, trunk identification of incoming calls, system status information, dialed number display and elapsed time of call.

The Attendant Console features an eight-line LCD display that gives prompts concerning call handling to ensure easy training. The display gives information about incoming calls, such as line status, name/number or trunk group identification, and a real-time display of the number of calls waiting in incoming queues.

The eight standard text messages include, "In conference until . . . " and "Lunch until . . . " Eight additional customized messages can be programmed into the phones.

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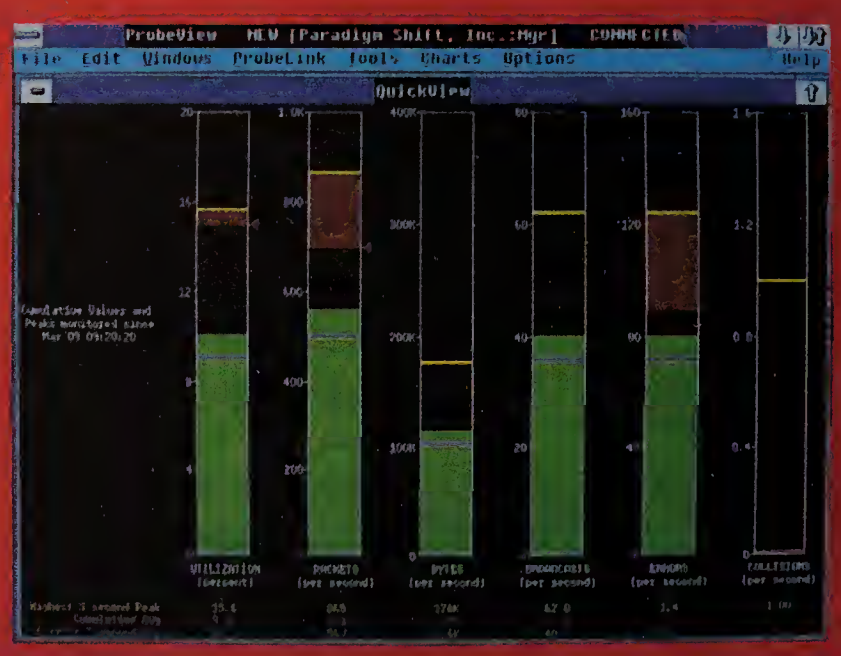
The console has 32 buttons for access to a variety of features such as park and page. Of these 32 buttons, 20 are preprogrammed and 12 can be programmed by the user. Like the Model 400 units, the console is compatible with industry-standard headsets.

Button Expansion Units can be added to the three phones or to the console. As many as three units can be added, providing up to 150 programmable buttons per station for large key system configurations.

The HCM system and digital phone sets cost from $300 to $500 per line, depending on configuration. That price includes the digital telephone equipment. HCM 200 is initially being marketed by Tel Plus and will be carried by Siemens Gold Seal Dealers in the future.

Siemens Information Systems can be reached by writing to 5500 Broken Sound Blvd., Boca Raton, Fla. 33487, or by calling (407) 994-8800.



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The LanProbe system lets you continuously monitor LAN traffic, track errors, set alert thresholds, and log critical network events. It maps the network for you. It tests for cable integrity

First Look

continued from page 35

works in their home office. The **Modem Mail 2.0** software contains features designed to give users flexibility in accessing E-mail messages from the road or their homes.

Modem Mail 2.0 consists of three pieces of software: Consumers Software's Inter-Network Courier 2.0, which resides on the local network; Modem Mail Postoffice 2.0, which sits on local network servers; and Modem Mail Remote User 2.0, which is loaded into the remote user's personal computer.

The new Mailbag Maintenance feature enables remote users to select which messages they want sent to their remote location instead of having all messages forwarded automatically. This saves the cost of sending unwanted mail.

A software program, dubbed Listen, runs on the remote personal computer, enabling the microcomputer to pick up and transmit mail in the background while users are running applications.

The remote personal computer requires 256K bytes of random-access memory, MS-DOS 3.1 or PC-DOS 3.1 or higher, and a Hayes Microcomputer Products, Inc. compatible modem.

The Inter-Network Courier software sells for $995, Modem Mail Postoffice software costs $495 per server and the Modem Mail Remote User software costs $95. All are available now.

Consumers Software, Inc., 603-73 Water St., Vancouver, B.C. V6B 1A1; (604) 688-4548.

Voice commands activate fax

continued from page 35

screen: "Heart is . . . enlarged." The knowledge base would also present options on the screen such as "mildly, moderately or massively," so the doctor could more precisely describe a patient's condition.

Another means of generating reports is in free-text mode, which enables users to speak words that then appear on the screen. Each user creates a personal voice profile with a vocabulary as large as 5,000 words. Profiles are created by entering multiple samples of words.

A typical report could be generated using a mix of trigger phrases and free-text speech, Martin said.

Multiple users can have voice profiles on the system which they activate by typing in their initials. Typical systems have 40M-byte hard disk storage for voice profiles.

VoiceFAX is available now as an option on new VoiceMED systems — VoiceRAD for radiology, VoiceEM for emergency medicine and VoicePATH for pathology — or it can be installed on existing systems. It costs $2,995.

Kurzweil Applied Intelligence can be reached by writing to 411 Waverley Oaks Road, Waltham, Mass. 02154, or by calling (617) 893-5151.

MS-DOS multiprocessor computers make debut

Data Voice Solutions Corp. recently announced two MS-DOS multiprocessor computers that support up to eight or 16 terminals and Novell, Inc.'s NetWare, letting users share resources such as printers and disks.

The **Centaur II Work Group 286** and the **Centaur II Work Group 386SX** contain multiple CPUs that run MS-DOS applications for terminals in either local or remote sites.

The systems support most terminals, including ASCII terminals and integrated voice/data terminals. Personal computers and IBM Personal System/2s can be linked to the computers using a net interface card or terminal-emulation software and the personal computer's serial port.

The Centaur II Work Group 286 uses an Intel Corp. 80286 microprocessor to coordinate communications among other processors using Novell's NetWare. The processor, which has 90M bytes of hard disk storage and a 1.2M-byte diskette drive, supports as many as eight users.

The Centaur II Work Group 386SX is based on an Intel 80386SX microprocessor and has 150M bytes of hard disk memory, a diskette drive and a 40M-byte tape drive. This minicomputer supports as many as 16 users.

The Work Group 286 costs $12,000 for a four-user system; the Work Group 386SX is priced at $22,000 for a 10-user system. The units are shipping now.

Data Voice Solutions Corp., 16842 Von Karman, Suite 200, Irving, Calif. 92714; (714) 474-0330.

Simpact unveils E-mail security application

Simpact Associates, Inc. recently introduced an electronic mail security application for personal computers supported by Novell, Inc. local networks.

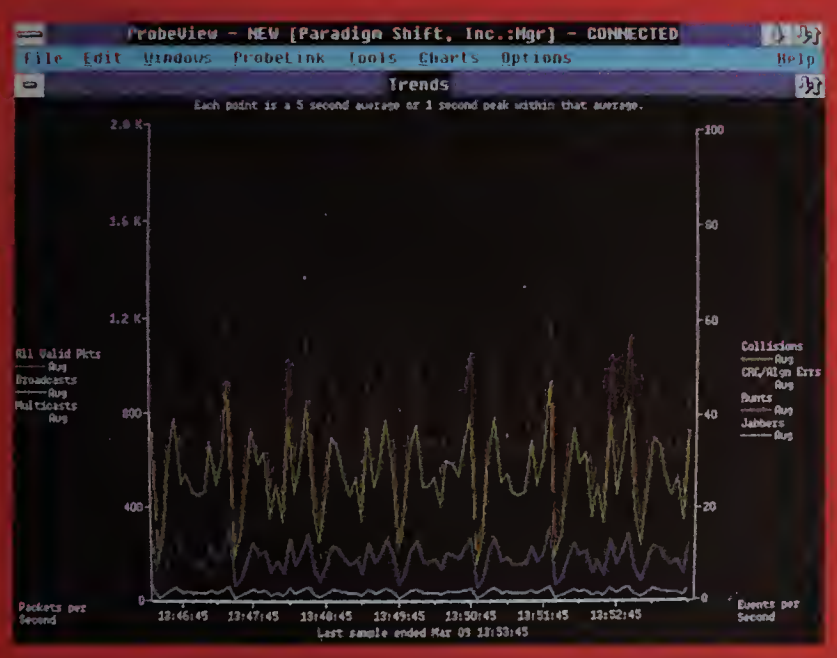
Securit-E-Mail allows users to limit access to their E-mail messages, encrypt messages, determine what will happen to messages after they reach their destination, determine whether a message they receive has been altered during transmission and identify the sender of a message.

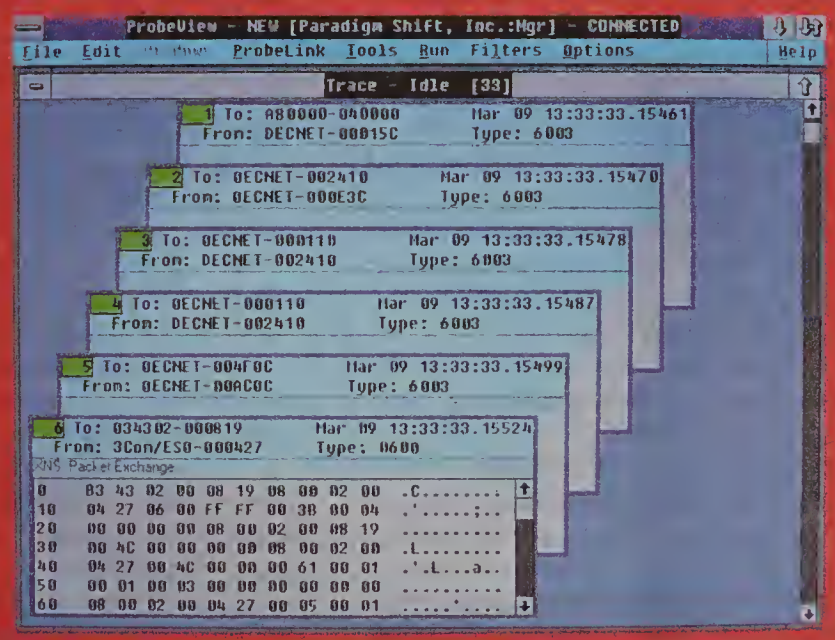
Securit-E-mail offers users a menu of options including access controls, disposition controls and a privacy feature that uses a public/private key technique to create an electronic signature. This indicates whether messages have been tampered with during transmission.

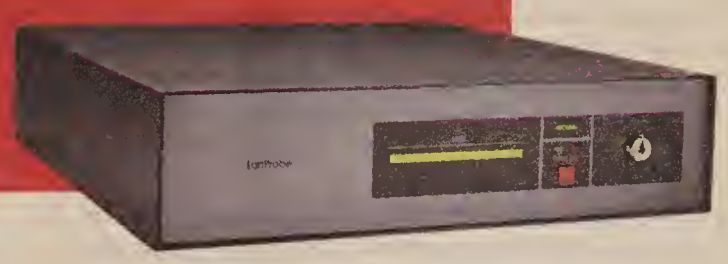
For users who want to continue using their own corporate E-mail systems, the company also provides a protected gateway that supports connections to most local net-based E-mail applications. Securit-E-Mail also has an application program interface for developing value-added applications.

Securit-E-Mail is being displayed this week at NetWorld '89 in Dallas and is available now for beta shipments. It costs $7,500 per server license and is scheduled for release in December.

Simpact Associates, Inc., 9210 Sky Park Court, San Diego, Calif. 92123; (619) 565-1865.







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OPINIONS

THE OPEN TOKEN FOUNDATION

BY ROBERT MADGE

A seat at the table reserved for IBM

The Open Token Foundation's (OTF) recent forum in St. Louis had an empty chair that vendors and users alike could not ignore. It was the chair reserved for IBM.

While IBM's absence may weaken OTF, it also hurts Big Blue, which misses out on a chance to work more closely with other token-ring vendors and token-ring users.

IBM's empty seat is like that of a child who is late for school — the absent pupil loses out until he arrives. Meanwhile, the OTF will continue to strongly advance the cause of openness in token-ring technology in the expectation that IBM will join later.

The reasons for this somewhat guardedly optimistic view are twofold: IBM's insubstantial reasons for not joining and the substantial opportunities IBM will forgo by remaining outside.

> Member or not, IBM will derive some benefits merely because of the OTF's existence.
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First, IBM said it already supported a sufficient number of standards-oriented organizations and that it did not see the need to join the OTF. In effect, IBM was saying it was resource-limited and that it didn't have the manpower and time to join in the activities of this organization. Thankfully, this view is not shared by the large number of vendors, even small companies, that have committed time and money to the OTF. This comes when IBM promotes token ring as the central plank of its connectivity strategy. I do not believe that IBM is resource-limited.

Second, IBM said it did not support the objective of the OTF to standardize implementation details — or application program interfaces — which, in IBM's view, would stifle innovation. In other words, IBM was saying that standards setting concerning protocols was fine but not so for the common definition of interfaces that would facilitate the development of compatible products.

Neither of those reasons is, in my mind, substantial. And if these are the only reasons that IBM has not joined the OTF, then I hope it will reconsider its decision and think about the benefits it would derive from being an OTF member:

- It will develop the market. Users who have been reluctant to adopt token ring on the basis that it is "IBM Token-Ring" and, therefore, somehow proprietary may rethink their position.
- It will increase the fluidity of technical interchange. By becoming an OTF member, IBM will gain easier access to the information research of others involved in the development of token-ring technology.
- It will increase the likelihood of properly functioning products. As an OTF member, IBM will be assisted in producing products that conform to its own generic specification for token ring — for example, by providing a mechanism for "prerelease" testing with other vendors' products.
- It will create a communications channel for users. From the OTF's forums, IBM will be able to learn about the experiences and requirements of users.

In addition to those benefits, IBM can more clearly communicate its commitment to openness by becoming a member of the OTF rather than by remaining outside.

Member or not, IBM will derive some benefits merely because of the OTF's existence. Like other nonmembers, IBM is welcome to purchase publications from the OTF — including the reports of proceedings such as the recent forum. Therefore, the OTF can deliver the same benefits it brings to the token-ring market to IBM and its users.

Madge is chairman of the Open Token Foundation.

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EDITORIAL

SNA users should levy peer pressure against IBM

A usually tight-lipped IBM has openly courted the press in recent weeks to remind the network community that its Systems Network Architecture has turned 15 years old and to drop a few hints as to how SNA may further evolve.

IBM recognizes that network managers will no longer stand by idly at the mercy of a mainframe, which in the last 15 years has been the single point of divine intervention for network traffic at user sites.

SNA architects say they intend to redistribute the bulk of network intelligence from VTAM software running in mainframes to distributed processors such as cluster controllers.

The goal, according to Rick McGee, IBM's manager of communication systems architecture, is to enable users to set up communications sessions and routing routines without involving the Network Control Program or VTAM.

"In the future, we see the host using the communications controllers mainly as access points into the intelligent network so the host can concentrate on its job of providing application services," he says.

Don't count on IBM delivering this capability anytime soon, though. IBM became big and fat selling mainframes and the large data storage devices that reside with them. Those products reportedly are where IBM makes its largest profit margins; it's not likely to cut them out of its communications plans overnight because users require it.

Another product, with equally palatable profit margins, will have to take up the slack. IBM has cultivated such a product — its Application System/400 minicomputer line — which is both richly profitable and pleasing to users.

The AS/400 will be the key to IBM's ability to create distributed networks because IBM intends to enlarge the scope of its Advanced Peer-to-Peer Networking (APPN), which the AS/400 already supports. APPN is capable of dynamic route selection and enables intelligent nodes to select network data paths based on various factors, including priority, speed and failed links.

> The migration from a mainframe-based network control scenario to a distributed architecture is sure to be a long one.
>
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IBM faces two challenges in remaking SNA. First, it must ensure that APPN-type functions designed for mid-range processors will work in a large-scale mainframe environment without sacrificing performance.

Second, it has to devise a strategy for migrating its massive installed base of mainframe users to APPN-like nets.

The migration from a mainframe-based network control scenario to a distributed architecture is sure to be a long one. Hopefully, IBM will wrap it up within the *next* 15 years.

Between now and then, though, network managers should begin contemplating some moves to keep IBM honest.

Sure, IBM has owned up to the fact that it devised SNA as a mainframe resource hog, but that doesn't mean it won't milk that old strategy for every buck it can get.

Network managers should consider the wealth of third-party SNA hardware and software already out there and intersperse it with IBM gear.

There's nothing like a little competition to keep suppliers in check. Also, this strategy allows users to send a clear message to IBM: This is the direction we're headed in; supply products for it, or we'll get them elsewhere.

As IBM distributes its network intelligence onto nodes such as cluster controllers, it will broaden the opportunities for third-party companies to emulate IBM's strategy and offer equal or greater value alternatives to the computer maker.

When that happens, users stand to gain from increased competition.

OPINIONS

Is Minitel a good model for the North American market?

PRO:

By James McGowan

Any American company that chooses to ignore the lessons of the French Minitel videotex system does so both at its own strategic expense and to the detriment of the economic progress of the U.S. The essence of the French success is a decentralized model. While this macromodel is critical to the successful development of videotex in the U.S., the specific equipment and technology the French employ is irrelevant.

In Montreal, the Canadians are now successfully implementing the French model but without French technology. Called Alex by Bell Canada, the small North American Presentation Level Protocol Standards (NAPLPS) terminals have already been used by consumers to place more than one million calls. Planners of the Alex project figured it would take two years to build a test user base of 20,000, but to their surprise, that number was reached within the first five months.

While the ambient French and American national technological, governmental and business environments are substantially different, the fundamental formula underlying the Minitel, and now the Alex, phenomenon is universal in nature.

The word Minitel refers not simply to a device or to a network. Rather, it describes a new industry in France. The Minitel industry has spawned scores of new companies, added a large degree of efficiency to the French life-style and economy and raised the technological awareness of the French populace.

Herein lies the single most important lesson to be learned from the bold French initiative into screen-based interactive services: Some new business concepts are inherently so large and complex that success requires a constellation of individuals, companies and governmental agencies all working in concert toward a shared goal. The only vaguely similar American enterprise is that of the National Aeronautics and Space Administration.

It's true that France Telecom is a monolithic, nationwide administrator of telecommunications services. But since there are more telephone lines in the New York metropolitan area than in the en-

(continued on page 57)

McGowan is president of Telesource, Inc., a New York-based communications and information services firm.

CON:

By Benjamin Compaine

One by one, the regional Bell holding companies have been rolling out their videotex gateway services. Limited by U.S. District Court Judge Harold Greene's rulings that restrict them from providing actual information or services, the RBHCs can only provide the gateway switch to information providers' computers and services. The RBHCs are essentially following the model of France Telecom's Teletel 3, or kiosk, videotex system.

Any policymaker or marketer looking to Minitel — the popular name for the French system — as the model for the U.S. videotex infrastructure would be led astray, perhaps disastrously so. A Minitel-like system, dominated by the RBHCs in particular, could thwart the development of the consumer videotex system in the U.S. A videotex strategy that relies on inexpensive terminals — or personal computers that emulate dumb terminals — and a centralized network defeats the advantages of the growing base of powerful personal computers in U.S. households.

In July, Greene ruled that AT&T will be permitted to become a full-range participant in the videotex market, free to provide content as well as equipment and the network. To some videotex enthusiasts, having AT&T as well as the RBHCs involved is just the right mix of players with deep pockets to get the still fledgling consumer videotex business moving in the U.S. These heavy hitters have the wherewithal to provide inexpensive home terminals for free or on a subsidized basis. Thus they can presumably overcome the major barrier to the mass videotex market — the need for a large base of users with receiving equipment.

After all, haven't the French shown the world that a videotex system can be established if every household is given a Minitel? If the system is to be run as a business, the answer is no.

Minitel was initiated by France Telecom, a governmental agency, for reasons of national prestige and as a symbol of a concerted national effort

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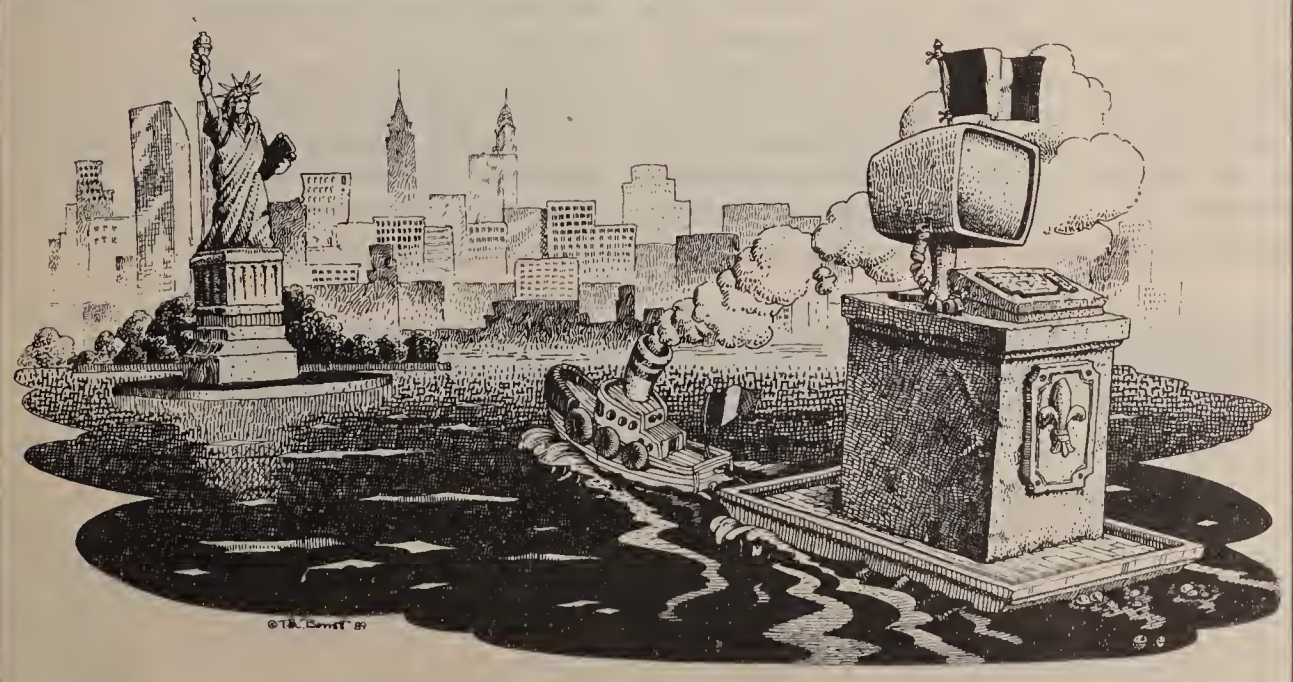
Compaine is president of Nova Systems, Inc. in Cambridge, Mass. He has copublished a study, "French Minitel: Strategic Lessons for Videotext in the U.S. Market" with Communications Trends, Inc. in Larchmont, N.Y.



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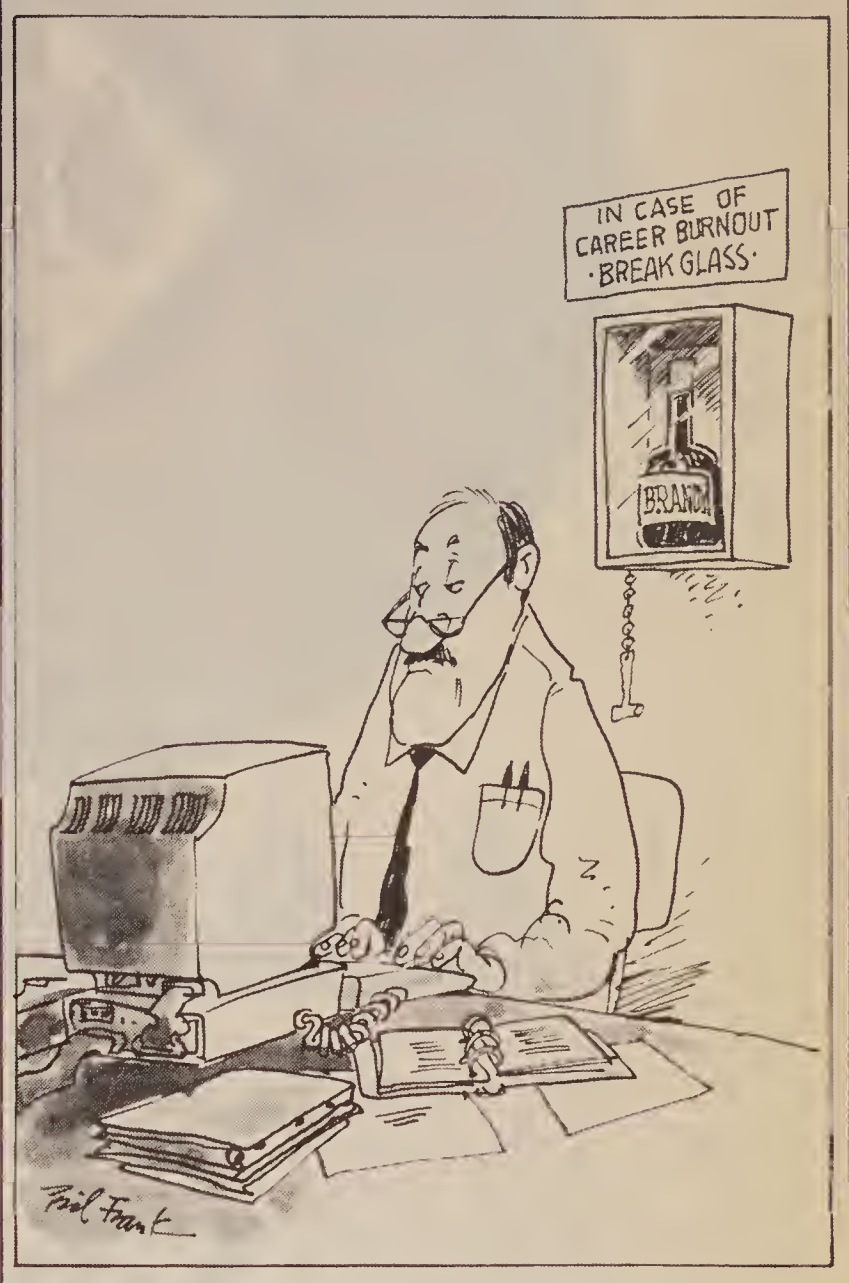
TELETOONS

BY FRANK AND TROISE



LETTERS

A simple answer?

In his column "Solving the puzzle of independent LU support," which appeared in the data communications section (*NW,* July 31), Joe Mohen states that "unless IBM steps forward and sheds some light, it's going to make it difficult for users to work with independent logical units."

It is to the credit of the editors of *Network World* that they have the foresight to realize the importance of new Systems Network Architecture technology such as IBM's independent logical unit (ILU) support. Technology such as this has the potential to create new and exciting opportunities for user networks that support distributed transaction applications.

Unfortunately, there has been some confusion in the industry regarding how ILUs work. I can well understand how any new technology can present somewhat of a dilemma to those attempting to

(continued on page 57)

Network World *welcomes letters from its readers.*

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LAN

OPERATING

SYSTEMS

Smooth operating

CONTINUED FROM PAGE 1
which they implement those functions and the hardware requirements demanded in order to do so that create the unique and varying products in the local net operating system category.

"Network operating systems, especially DOS-based operating systems, have the greatest selection of software in the history of the world," says Tom Henderson, president of Corporate Networks, Ltd., a systems integration firm in Indianapolis. Available vertical applications range from professional services to professional sports and from rural farm management to high-tech manufacturing and processing control.

The system administration edge that minicomputers once held is eroding because, as Sally Hatchett, manager of office technology for Vinson & Elkins, a Houston-based law firm, states, "LAN OSs are becoming easier to use and administer without knowing a lot of technical information."

Today's local nets offer a full suite of security, performance measurement and network management features, and they allow users to send and retrieve information across different minicomputer and mainframe environments. According to Fred Haught, a senior manager at Peat Marwick Main & Co., a consulting firm in Chicago, "The LAN operating system is being viewed more as a platform to connect the PC, mini and mainframe operating environments together, rather than just to connect PCs to PCs.

"In general," he says, "the issue is whether the LAN operating system provides interfacing capabilities to [Digital Equipment Corp.] VAXes, [Hewlett-Packard Co.] HP/3000s and [IBM] AS/400s, not whether it will replace them."

Another recent trend is the emergence of wireless local network operating systems, which extend local net operating system software and hardware beyond

Guengerich is a senior consultant for Business Systems Group, Inc., a Houston-based consulting firm specializing in networking and distributed data base applications.

LAN users today can enjoy the convenience of a full range of security, performance and management features.

previous media limitations.

Hale Pringle, director of the University of Central Florida's LAN Institute in Orlando, touts wireless local nets as the "right thing, particularly where wiring is difficult. However, the problem that I see with these LANs is that they need to get data rates up higher." Data rates on these kinds of products are about 9600 baud but to be useful, they need to be at least 2M bit/sec.

Two examples of wireless local nets are O'Neill Communications, Inc.'s Local-Area Wireless Network (LAWN) and Photonics Corp.'s Photolink, which is slated to be released this fall.

Low end, high end

Low-cost local networks can support file exchange and printer sharing without the use of a dedicated file server. These local networks typically have a limit on the number of workstations and include CBIS, Inc.'s Network-OS; Artisoft, Inc.'s LANtastic; the TOPS division of Sun Microsystems, Inc.'s TOPS/DOS; Corvus Systems, Inc.'s ReadyNet and PC/NOS; Western Digital Corp.'s ViaNet; and Novell, Inc.'s NetWare ELS I and ELS II.

Most low-cost local nets use DOS as the basis for their server filing system; however, the NetWare ELS products use a proprietary system, and 3+Open LAN Manager employs OS/2, which uses a hierarchical filing system.

"The low-cost market is extremely active," Pringle says. "There are 10 to 20 companies involved due to a gap underneath the high-end products. My concern is that when you get into file sharing, it requires a sophisticated process. I haven't seen any of these companies take off and 'own' the market yet."

High-end local net products are based on OS/2 or other non-DOS operating systems such as Unix. Those systems provide better performance than DOS operating systems, usually rely on a dedicated file server and provide advanced security, net management and superior file and printer sharing. Third-party add-on functions and features usually cost extra.

This category of operating systems includes 3Com Corp.'s 3+Open, which uses OS/2 LAN Manager, Novell's SFT NetWare, which uses a proprietary system, and Banyan Systems, Inc.'s Unix-based VINES/386.

In the future, other factors such as ease of installation may become an important concern in users' purchasing decisions about local net operating systems. Installation parameters required by a local net installation program may include the type of hard disk controller, the network interface card driver and its configuration, parallel and serial ports, the display adapter, the volume name and size, as well as other parameters. Ease of installation is usually a good indication of ease of maintenance.

CHART • GUIDE

A chart examining local network operating systems from a variety of vendors starts on pages 42 and 43.

"The harder it is to install, more than likely, the harder it will be to keep going," says John McCann, an independent systems developer from Austin, Texas, who does work for Brightwork Development, Inc. in Tinton Falls, N.J.

One local net operating system that has received a great deal of press over the past two years is OS/2 LAN Manager, developed jointly by Microsoft Corp. and 3Com and adopted by IBM as a product standard. OS/2 LAN Manager is the first OS/2-based local net operating system that supports both DOS and OS/2 workstations and applications.

Local net operating systems developed under OS/2 LAN Manager are 3Com's 3+ Open, Torus Systems Inc.'s Tapestry II LAN Manager, IBM's OS/2 LAN Server and 10NET Communications' 10Net Plus.

Novell strategy

Nonetheless, one vendor of local net operating systems not based on OS/2, Novell, has provided OS/2 networking capabilities through emulation of interfaces within its proprietary systems. For example, Novell recently announced Version 1.1 of its OS/2 Requestor software, which takes advantage of the Named Pipes interface and OS/2 applications to be run from NetWare as well as other local net operating systems.

OS/2, however, has received a lot of criticism, such as claims that OS/2 Extended Edition takes

(continued on page 46)

Local net operating systems

Vendor	Product	OS type	Net adapters supported	Dedicated or nondedicated file server	Supported file server CPUs	File server RAM requirements (bytes)	Total address storage	Workstation OS	Minimum workstation RAM (bytes)	Maximum number of connections per file server	Fault tolerance
Artisoft, Inc. Tucson, Ariz. (602) 293-6363	LANtastic Network Operating System	MS-DOS, PC-DOS	LANtastic 2 Mbps and .7 Mbps, Arcnet, Ethernet, IBM Token-Ring, NETBIOS-compatible	Allows both	IBM Personal Computer XT, AT and 80386 compatibles	Minimum: 32K Maximum: user-defined based on system parameters	DOS limits	DOS 3.1 to 4.0 (DOS 3.2 not recommended)	12K	120	Tape backup
AT&T Morristown, N.J. (800) 247-1212	StarGROUP Software 386 Server (Release 3.2)	AT&T Unix System (Release 3.2)	AT&T Starlan 10, AT&T Starlan (1M bit/sec), Ethernet	Allows both	AT&T 6386 WorkGroup System family of PCs	Minimum: 4M Maximum: 64M	1.2G bytes	PC/MS-DOS 3.1+	256K	4M RAM: 72 clients; 8M RAM: 128 clients	Tape backup
Banyan Systems, Inc. Westborough, Mass. (508) 898-1000	VINES/286	DOS-compatible proprietary based on Unix System V	Arcnet, Ethernet, David Systems, Inc., IBM PC Net, Omninet-1B, ProNet 10, Starlan, Token-Ring, VistaLAN	Dedicated	IBM Personal Computer AT and 80286 compatibles	Minimum: 2M Maximum: 16M	240M bytes	DOS 2.1 to 4.0	100K	Unlimited	Tape backup, uninterruptible power supply (UPS) monitoring, disk mirroring via Trellis (third-party product)
	VINES/386	DOS-compatible proprietary based on Unix System V	Arcnet, Ethernet, David Systems, IBM PC Net, Omninet-1B, ProNet 10, Starlan, Token-Ring, VistaLAN	Dedicated	Compaq Computer Corp. Deskpro 386 and compatibles; IBM Personal System/2 Models 70, 80 and compatibles	Minimum: 4M Maximum: 16M	1.2G bytes	DOS 2.1 to 4.0	100K	Unlimited	Tape backup, UPS monitoring, disk mirroring via Trellis (third-party product)
CBIS, Inc. Norcross, Ga. (404) 446-1332	Network-OS	DOS 3.X, 4.0	Arcnet, Ethernet, Starlan, Token-Ring and compatibles (over 35 network interface cards supported)	Allows both	IBM Personal Computer XT, AT and compatibles; Personal System/2	Minimum: 640K	Anything DOS supports via third-party disk manager	DOS 3.X, 4.0	50K to 60K (640K recommended)	254	Tape backup, UPS monitoring
Corvus Systems, Inc. San Jose, Calif. (408) 281-4100	ReadyNet	DOS	ReadyNet	Allows both	IBM Personal Computer, XT, AT, 80386, Personal System/2 models and compatibles	174K	Unlimited in 32M-byte segments	DOS 2.X to 3.30	60K	24	UPS (with add-on)
	PC/NOS	DOS	Arcnet, Ethernet, NETBIOS, Omninet/1, Omninet/4, TandyLink, Token-Ring	Allows both	IBM Personal Computer, XT, AT, Personal System/2 models, 80386s and compatibles	184K	Unlimited in 32M-byte segments	DOS 2.X to 3.30	66K	Unlimited	UPS (with add-on)
	Corvus LAN Manager	DOS and OS/2	Etherlink, Omninet/1, Omninet/4, IBM PC Network, Token-Ring	Allows both	80286, 80386 and Personal System/2 compatibles	4M	0.5G byte	DOS, OS/2	DOS: 640K OS/2: 2M	2,000	UPS (with add-on)
Datapoint Corp. San Antonio, Texas (512) 699-7000	DataLAN	DOS	NETBIOS-compatible	Allows both	80286 and 80386 compatibles	Minimum: 640K Maximum: 32M	12G bytes	MS-DOS 3.0+	80K including NETBIOS	255	Tape backup, UPS monitoring, disk mirroring, disk duplexing
DCA's 10NET Communications Dayton, Ohio (513) 433-2238	10NET Plus for NetBIOS LANs	DOS	NETBIOS-compatible	Allows both	IBM Personal Computer, XT, AT and 80386 compatibles	Minimum: 110K Maximum: 130K	Limited by DOS or subsystem limits	DOS 3.X+	50K	255	UPS via third party; disk mirroring via third-party subsystems
DSC Communications Corp. Campbell, Calif. (800) 289-6396	NEXOS 286 Operating System Software	Proprietary	Ethernet, Token-Ring, Arcnet	Dedicated	80286	640K	4G bytes	DOS 2.X or higher	256K	24	Tape backup, transaction logging, buffered transaction logging, disk repair utility, disk cache write-through
	NEXOS 386 Operating System	Proprietary	Ethernet, Token-Ring, Arcnet	Dedicated	80386	2M	4G bytes	DOS 2.X or higher	256K	255	Tape backup, transaction logging, buffered transaction processing, disk repair utility, disk cache write-through
IBM White Plains, N.Y. (800) 426-2468	OS/2 LAN Server	OS/2 Extended Edition	All IBM Token-Ring and PC Network adapters	Nondedicated	IBM Personal System/2, Personal Computer AT, XT 286 and compatibles	3M (includes OS/2 Extended Edition)	13M bytes	OS/2 Extended Edition, DOS with IBM PC LAN Program 1.3.1	OS/2: 3M DOS: 256K	128	Not applicable
	PC LAN Program	PC DOS 3.3 or 4.0	All IBM Token-Ring and PC Network adapters	Nondedicated	IBM Personal System/2, Personal Computers and compatibles	512K (includes 345K server, DOS, protocol drivers, applications)	404K bytes	DOS 3.3 or 4.0	256K	251	Not applicable
Novell, Inc. Provo, Utah (801) 379-5900	ELS NetWare Level I	Proprietary	Arcnet, Ethernet, PC Network/2 and compatibles	Nondedicated	80286, 80386, IBM Personal System/2 and compatibles	Minimum: 640K base plus 512K extended	Two 255M-byte internal drives	DOS 3.X, Windows 80386	60K plus application memory	4	None
	ELS NetWare Level II	Proprietary	Over 30 different adapters including Novell, Arcnet, Ethernet and Token-Ring compatibles	Allows both	80286, 80386, IBM Personal System/2 and compatibles	Minimum: dedicated 1M, nondedicated 2M; Maximum: 12M	Two internal hard drives	DOS 2.X to 4.X; Windows 80386; Macintosh; OS/2	70K plus application memory	8	Tape backup, UPS monitoring
	Advanced NetWare	Proprietary	Over 90 different adapters including Novell, Arcnet, Ethernet and Token-Ring compatibles	Allows both	80286, 80386, IBM Personal System/2 and compatibles	Minimum: 2M Maximum: 12M	2G bytes	DOS 2.X to 4.X; Windows 80286, 80386; Macintosh; OS/2	70K plus application memory	100	Tape backup, UPS monitoring
	SFT NetWare	Proprietary	Over 90 different adapters including Novell, Arcnet, Ethernet and Token-Ring compatibles	Dedicated	80286, 80386, IBM Personal System/2 and compatibles	Minimum: 2M Maximum: 12M	2G bytes	DOS 2.X to 4.X; Windows 80286, 80386; Macintosh; OS/2	70K plus application memory	100	Tape backup, UPS monitoring, disk mirroring, disk duplexing
	NetWare 386	Proprietary	Arcnet, Ethernet, Token-Ring, PC Network, PC Network/2	Dedicated	Novell 386 AE, IBM Personal System/2, 80386 and compatibles	Minimum: 2.5M Maximum: 4G	32T bytes	DOS 5.0	640K recommended	250	Tape backup, UPS monitoring, disk mirroring, disk duplexing
O'Neill Communications, Inc. Raleigh, N.C. (800) 624-5296	Local Area Wireless Network (LAWN)	DOS	Not applicable	None (requires no server)	Not applicable	Not applicable	Not applicable	DOS	256K	Not applicable	None

(continued on pages 46 and 47)

Maximum number of open files	Number of network printers	Supports print servers	Number of bridges	Mainframe connectivity	Remote communications connectivity	OS/2 support	Macintosh connectivity	Electronic mail	Copy protected	Price
255	Parallel: 3 Serial: 3	Yes	Internal: 4 External: None	IBM mainframe (with additional hardware)	Yes	No	No	Yes	No	$325 for .7 Mbps Starter Kit; $525 for 2 Mbps Starter Kit; $725 for Ethernet Starter Kit; prices effective Oct. 1, 1989
Unlimited	40 (any mix of parallel and serial)	Yes	Internal: None External: Unlimited	DEC VAX (optional); IBM mainframe (optional)	Yes (optional)	No	No	Yes (optional)	No	$2,295
5,000	Parallel: 2 Serial: 3	Yes	Internal: 2	DEC VAX; IBM mainframe	Yes	No	Only E-mail and ASCII file transfer	Yes	No	$1,995
5,000	Parallel: 3 Serial: 2	Yes	Internal: 4	DEC VAX; IBM mainframe	Yes	No	Only E-mail and ASCII file transfer	Yes	No	$4,995
255	Parallel: 3 Serial: 2	Yes	Internal: 1 per file server, 3 per network External: none	DEC VAX (via third party); IBM mainframe (via third party)	Yes	No	Yes (via third party)	Yes	No	$160 per node; $1,280 for 8- to 30-user site license
400	Parallel: 96 Serial: 96	Yes	None	IBM mainframe (optional)	Yes	No	No	Yes	No	$249 per node
400	Parallel: unlimited Serial: unlimited	Yes	None	IBM mainframe (optional)	Yes	No	No	Yes	No	$1,395 per network
32,000	Parallel: unlimited Serial: unlimited	Yes	Internal: Yes External: Yes	IBM mainframe (optional)	Yes	Yes	No	Yes	No	$2,750 per network
255	Parallel: 765 Serial: 510	Yes	Internal: 5 External: Arcnet, Ethernet, Starlan, Token-Ring	DEC VAX, IBM mainframe	Yes	Yes	Supports TOPS	Yes	No	$595 for 4 users; $1,195 for 8 users; $1,995 for up to 255 users; $1,995 for dedicated server; $595 for disk mirroring
To DOS limits	Parallel: 2 per superstation (unlimited by LAN); Serial: 1 per superstation (unlimited by LAN)	Yes	Internal: 1 per workstation External: unlimited	IBM mainframe (via DCA Irmalan, third party)	Yes (via CrossTalk Remote; R2 LAN)	No	Yes (via third party)	Yes	No	$795 for 8 users; $2,595 for unlimited users (limited by bridge or gateway)
256 per workstation, unlimited per server	Parallel: 4 Serial:4	Yes	Limited only by available NETBIOS sessions (up to 90 sessions)	IBM, DEC VAX, Unix, 3270, 5250, TCP/IP, asynchronous and X.25	Yes	No	No	Yes	No	$795 and up
256 per workstation, unlimited per server	Parallel: 4 Serial: 4	Yes	Limited only by available NETBIOS sessions (up to 90 sessions)	IBM, DEC VAX, Unix, 3270, 5250, TCP/IP, asynchronous and X.25	Yes	No	No	Yes	No	$3,295
255	9 per server with an unlimited number of servers per network	Yes	Unlimited number of bridges in network with a single route not exceeding 7 hops	Yes	Yes	Yes	No	Optional product	No physical restrictions; license restrictions: can make one copy for backup only	$1,040 for single unit; $939 for additional license, with volume discounts up to 30% and special bid pricing
255	3 per server with an unlimited number of servers per network	Yes	Unlimited number of bridges in network with a single route not exceeding 7 hops	Asynchronous via optional product	Optional product	No	No	Optional product	No physical restrictions; license restrictions: can make one copy for backup only	$245 for single unit; $189 for additional license, with volume discounts up to 30% and special bid pricing
1,000	Parallel: 3 Serial: 2	No	None	DEC VAX and IBM mainframe (optional Novell products available)	Yes (optional Novell products available)	No	No	Yes	Yes	$695
1,000	Parallel: 3 Serial: 2	Yes (via third party)	Internal: 3 (Macintosh support) External: optional	DEC VAX and IBM mainframe (optional Novell products available)	Yes (optional Novell products available)	Yes (optional Novell product available)	Yes (optional Novell product available)	Yes	Yes	$1,595
1,000	Parallel: 3 Serial: 2	Yes (via third party)	Internal: 4 External: 4	DEC VAX and IBM mainframe (optional Novell products available)	Yes (optional Novell products available)	Yes (optional Novell product available)	Yes (optional Novell product available)	Yes	Yes	$2,995
1,000	Parallel: 3 Serial: 2	Yes (via third party)	Internal: 4 External: 4	DEC VAX and IBM mainframe (optional Novell products available)	Yes (optional Novell products available)	Yes (optional Novell product available)	Yes (optional Novell product available)	Yes	Yes	$4,695
100,000	Unlimited parallel and serial within memory constraints	Yes	Internal: 16 External: unlimited	DEC VAX and IBM mainframe (optional Novell products available)	Yes (optional Novell products available)	Yes (optional Novell product available)	Yes (optional Novell product available)	Yes	No	$7,995
Not applicable	Unlimited	Yes	Not applicable	DEC VAX and IBM mainframe via terminal-emulation software	Yes	No	No	Yes	No	$495 per node

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NETWORK WORLD

Local net operating systems

Vendor	Product	OS type	Net adapters supported	Dedicated or nondedicated file server	Supported file server CPUs	File server RAM requirements (bytes)	Total address storage	Workstation OS	Minimum workstation RAM (bytes)	Maximum number of connections per file server	Fault tolerance
3Com Corp. Santa Clara, Calif. (800) 638-3266	3+ Share	DOS	3Com EtherLink, EtherLink II, EtherLink Plus, EtherLink MC, EtherLink NB, EtherLink SE, TokenLink, TokenLink Plus, IBM Token-Ring I, II, /A	Allows both	80286, 80386 compatibles	896K	4G bytes	DOS 3.X	DOS: 512K (640K recommended) OS/2: 512K (640K recommended)	240	Tape backup (only with dedicated server)
	3+ Open	OS/2	3Com EtherLink, EtherLink II, EtherLink Plus, EtherLink MC, EtherLink NB, EtherLink SE, TokenLink, TokenLink Plus, IBM Token-Ring I, II, /A	Allows both	80286, 80386 compatibles	Minimum: 4M	4G bytes	DOS 3.X; OS/2	DOS: 512K (640K recommended) OS/2: 2.5M	Advanced system: 254; Entry system: 5	Tape backup (only with dedicated server)
The TOPS Division of Sun Microsystems, Inc. Alameda, Calif. (415) 769-9669	TOPS DOS 2.1	DOS 3.X	LocalTalk, FlashTalk, Ethernet	Allows both	8086, 8088, 80286, 80386	File server only: 190K; Print server, file server: 226K	Unlimited	DOS 3.X	120K	20	Tape backup
	TOPS for Sun 2.2	Server: Unix; Clients: Macintosh or DOS	Ethernet, AppleTalk	Allows both	Sun 3, Sun 4, 386i	Minimum: 4M (lowest Sun) Maximum: unlimited (highest Sun)	Several gigabytes (depending on Unix workstation memory)	Macintosh 4.2 to 6.0; DOS 3.X+; Sun OS 3.5, 4.X	DOS: 640K Macintosh: 1M	20	Tape backup
Torus Systems, Inc. Redwood City, Calif. (415) 594-9336	Tapestry II LAN Manager	DOS, OS/2	Arcnet, Ethernet, Token-Ring (NETBIOS-compatible)	Allows both	80286, 80386 compatibles	DOS: 640K OS/2: 4M	DOS: 32M OS/2: 4G	DOS 3.1+; OS/2 1.0+	640K	Unlimited	None
Ungermann-Bass, Inc. Santa Clara, Calif. (408) 496-0111	NET/ONE LAN Manager	OS/2 1.0, 1.1	Ethernet, Token-Ring compatibles	Allows both	IBM Personal Computer XT, 80286, 80386, Personal System/2 and compatibles	Minimum: 4M Maximum: 16M	88G bytes (depends on OS)	OS/2 1.0, 1.1; DOS 3.1+	DOS: 512K OS/2: 2M	Ethernet: 96; Token-Ring: 48 (depends on adapter)	Tape backup
Waterloo Micro Systems Norcross, Ga. (404) 441-9252	PORT Lite	Proprietary	Arcnet compatibles	Allows both	IBM Personal Computer, XT, AT, Personal System/2 and compatibles	Minimum: 384K	5 disk drives	PC MS/DOS	50K	5 (10 supported with PORT Lite Expander Option)	UPS monitoring, tape backup
	PORT	Proprietary	Arcnet, Token-Ring compatibles	Allows both	IBM Personal Computer, XT, AT, Personal System/2 and compatibles	Minimum: 384K	5 disk drives	PC MS/DOS	50K	25	UPS monitoring, tape backup
Western Digital Corp. Irvine, Calif. (714) 863-0102	ViaNet	DOS 3.3 (does not support 4.0)	Western Digital Ethernet, Western Digital Starlan, Arcnet	Allows both	IBM Personal Computer XT, 80286, 80386, Personal System/2 and compatibles	Minimum: 256K Maximum: 640K	DOS 3.3 limits	DOS 3.X (not 4.0)	256K	255	Tape backup

(continued from page 41)
up too much memory, particularly at the workstation, and that it is slower than anticipated. Also, it has not garnered a large enough base of real (or even announced) OS/2 applications to afford what some users view as a costly migration from the DOS-based world ("3Com report stuns local net market," *NW,* Aug. 14).

File server requirements

If the local net operating system is the lifeblood of a network, then the file server is its heart. Both the requirements of the local net operating system and the technical network design determine the configuration of the file server.

The local net operating system influences the type of microprocessor used, the minimum and maximum amounts of extended memory and the minimum amount of hard disk storage.

The technical network design is affected by the number of parallel and serial ports, the amount of hard disk storage, the number of network interface cards and the file server's display adapter.

Some local net operating systems allow the user to choose whether to install a dedicated or nondedicated file server. If economics is a critical factor, a nondedicated file server, which can perform double duty as a workstation, may be the better choice — especially if it will be used in a small office of two to eight users with a relatively low amount of file processing activity.

With today's high-performance local net operating systems, however, a dedicated file server is not only becoming mandatory, it's a more dependable solution as well. Because its resources are not shared by other local applications, one by-product of a dedicated file server is increased performance.

Also, using a dedicated file server decreases the risk of a user accidentally rebooting it. A dedicated file server may require less memory than a nondedicated file server, depending on what applications are used on it. And an inexpensive monochrome monitor, for viewing system error messages and so forth, is all that's necessary.

"My clients are looking for high-performance machines that run at 25 to 33 MHz and use intelligent disk controllers. Those are the two major components that are going to increase performance, and I see the demand for higher performance in file servers continuing as a major trend," says Rich Binkus, a consultant with Chicago-based Netcom Associates, Inc., a systems design and local network consultancy.

> If the local net operating system is the lifeblood of a net, the file server is its heart.
>
> ▲▲▲

Workstation requirements

Like the file server, much of a workstation's configuration is dictated by the local net operating system and by the technical design.

Because most of today's local net operating systems are still MS-DOS-based, the amount of workstation memory is an important element. Since MS-DOS has a limited application work space of 640K bytes of random-access memory, local net vendors have been forced to squeeze the workstation portions of operating systems to provide as much room as possible for the actual application programs and data. This size limit has sometimes forced operating system vendors to choose between functionality and practicality.

A couple of developments are helping to settle this dilemma. First is the advent of distributed processing on local networks.

On the operating system front, applications running under local nets will be able to run on the file server and other specialized servers once they are widely available. This approach will free the workstations from the memory constraints they have had.

"The added memory consumed by the network shell is a problem," says Jim Rosen, vice-president of LAN Systems, Inc., a local network systems integration and software development firm in New York.

"I see the trend for LAN operating systems to reduce their memory overhead and for applications to become more clever about saving memory," he says.

The second development helping to solve the problem of workstation memory shortage is the advent of workstation memory management and, in some cases, memory-conserving software.

Binkus says the "use of memory-tasking software, such as Microsoft's Windows and Quarterdeck Office Systems, Inc.'s DesqView, is an important piece of workstation memory management."

For local net operating systems that don't require a disk drive in the workstation, diskless workstations are an option. Usually smaller in size than a personal computer, they use less expensive power supplies and operate without fans.

Each unit uses a special read-only memory chip, placed on the motherboard or the diskless workstation's network interface card, that receives a DOS boot from the file server. The diskless workstation's MS-DOS boot files, such as CONFIG.SYS, and other files are stored on the file server's hard disk. DOS boot ROMs for diskless workstations are available, but OS/2 boot ROMs are still under development.

Because users can't copy data from the file server's hard disk, diskless workstations are considered more secure than conventional workstations.

However, since diskless workstations rely on the centralized disk drives of the file server to operate, an uninterruptible power supply unit and a tape backup system become strong purchasing considerations for the network. Most diskless workstations have a complete set of parallel and serial ports that can be used for printers and modems.

With the increasing need for graphics and design capabilities,

(continued from pages 42 and 43)

Maximum number of open files	Number of network printers	Supports print servers	Number of bridges	Mainframe connectivity	Remote communications connectivity	OS/2 support	Macintosh connectivity	Electronic mail	Copy protected	Price
20,000 or more, one-to-one	5 per PC server; 12 per 3S/400 server	Yes (via third party)	Internal: 2	IBM mainframe and TCP/IP hosts	Yes	No	Yes	Yes (optional)	No	$2,495 (includes File/Print service, Name service, Menu service, TurboShare, NetDOS, Start)
20,000 or more, one-to-one	12 or more per server based on number of ports on hardware	Yes (via third party)	Internal: 4	IBM mainframe and TCP/IP hosts	Yes	Yes	Yes	Yes	No	$995 for entry-level system (5 nodes); $2,995 for advanced system (254 nodes)
100	Parallel: one per server	Yes	Full support for AppleTalk zones	None	No	No	Yes	Optional	No	$189
Unlimited	Unlimited	Yes	Internal: one EtherTalk bridge External: unlimited	DEC VAX (via NFS gateway), IBM mainframe	Yes	No	Yes	Optional	Yes	$895 for 1 to 4 users; $1,595 for more than four users
Limited by DOS, OS/2	Parallel: 3 per print server; Serial: 4 per print server (Any workstation can be a print server)	Yes	Internal: DOS: 1 OS/2: limited by CPU expansion slots	DEC VAX (VT100 and VT220 emulation included); IBM mainframe (purchased separately)	Yes (purchased separately)	Yes	Yes (via third party)	Yes	Yes	$2,995 for 8 workstations, 1 OS/2 LAN Manager Server; $250 to $395 for additional stations (depending on volume)
OS dependent	Parallel: 2 Serial: 2 (total on network: 32)	Yes	Internal: unlimited External: unlimited	DEC VAX, IBM mainframe	Yes	Yes	Yes	Yes	Not on workstations	$995 for entry-level system (5 nodes); $2,995 for advanced system (254 nodes)
70 DOS files per server	Parallel; 10 Serial: 10 (No more than 15 total)	Yes	None	No	No	No	No	Yes	No	$495
70 DOS files per server	Parallel: 10 Serial: 10 (no more than 15 total)	Yes	255 (one bridge per workstation); internal, external, or both	DEC VAX and IBM mainframe	Yes	No	No	Yes	No	$2,495
20	Total of 255 parallel and serial	Yes	None	No	Yes	No	No	No	Yes	$99

SOURCE: BUSINESS SYSTEMS GROUP, INC., HOUSTON

an important feature of local net operating systems is the ability to work with Adobe Systems, Inc.'s PostScript printers.

NetWare provides this feature either by directly printing to PostScript printers on the NetWare local network or by going through NetWare-supported Apple Computer, Inc. AppleTalk links for PostScript printers, such as the Apple LaserWriter.

3Com's 3+Open also handles PostScript font and dictionary downloading; however, unlike NetWare, it does not support AppleTalk connections for PostScript printers.

Auditing and accounting

By detailing how the network resources are being used, local net auditing features help the local net administrator detect system bottlenecks and work to fine-tune system performance.

With local network accounting features, administrators can create account balances to charge users for utilization of the local net. For example, the amount of data processed by a user — measured by the number of blocks read and written — and the amount of disk space consumed by a user's files can be tracked. This information is useful in determining how to allocate expenses, such as local network maintenance and support, to the various user departments.

Since the accounting and auditing processes can consume a great deal of hard disk storage, some of the high-end local nets have the ability to prevent the operating system from gathering unnecessary information.

For example, VINES/386, 3+Open and OS/2 LAN Server allow the local network administrator to specify which resources are to be monitored.

Performance monitoring

System performance information is needed to fine-tune or modify a network properly. Some local net operating systems include monitoring functions with the software. The amount and level of detail these functions offer can range from a small screenful to reams of reports.

Performance tuning begins at the installation phase of the local net operating system. Configuration parameters — such as the number of communications buffers, open files, indexed files and transactions to be monitored — and whether disk caching is to be used are defined at that phase. Periodically, these system parameters may need to be altered based on changes in the performance of the local net.

One example of a vendor's performance monitoring product is Banyan's VINES Network Management System, which is an add-on package purchased separately that runs with VINES/386. This product provides extensive system performance information, such as resource utilization and demand-vs.-service data.

Operating systems that support configuration default settings already established at more than adequate parameters are the easiest to fine-tune. Unless the network undergoes extensive expansion, the initial settings are adequate.

In more dynamic local net environments, determining accurate parameter settings may require complex mathematical computations.

Network management

As local nets grow and increase their capabilities — moving toward the goal of being enterprisewide — they will become more difficult to manage and require better management features.

To provide additional troubleshooting and performance monitoring features, vendors are enhancing the network administration capabilities of their network operating systems. Administrative and security features from wide-area networking are being incorporated into local net software.

For example, 3Com's 3+Open and Torus' Tapestry II offer network alert systems that sound a warning when a printer needs paper or when a disk is almost full. Novell's NetWare enables net managers to limit the amount of disk space taken by individual users and charge for resource usage by user or work group. Corvus' LAN Manager allows one workstation to monitor or control the screen activity on another workstation.

> "One can't build an enterprise network without [global] naming services."
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Internetworking

Many local net operating systems deliver standard software, which allows for bridging local networks. A bridge can be a file server or it can be a separate personal computer that is set up specifically as a bridge.

In either case, the bridge makes it possible for users on one local net to access the resources of another local net. The bridge itself is usually where the bridge software is run and, with few exceptions, contains one network interface card for every unique local net to which it is connected.

Global naming schemes have been the subject of much controversy lately.

The key to global naming is allowing users, via a group privilege, the ability to reference resources on other local nets on the internetwork without requiring that they log on to every network and know exactly on which local net the resource they want to use is located. Also, they don't need to know the exact internetwork location of the resource they want to use.

"Named services are at an early stage," says David Ferris, president of Ferris Networks, Inc. of San Francisco. "Any network operating system [made] five years from now will have to be built on naming services." The leader is StreetTalk by Banyan, followed closely by 3Com's naming services. "It is clear that one can't build an enterprise network without [global] naming services being an integral part of the network," Ferris adds.

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NetWare lacks global naming services. However, sources in the company have identified this feature as a critical enhancement of Novell's new 80386-based local net operating system.

Additional connectivity

Today, vendors are providing for multivendor connectivity by either standardizing on their own or another vendor's communications protocols, or by providing the flexibility to allow protocol-independent communications software, such as Transmission Control Protocol/Internet Protocol products, to bridge the gap between different operating systems.

One example of standardizing on other vendors' protocols is in the area of Macintosh connectivity. TOPS was an early local net operating system that provided for IBM Personal Computer and Macintosh connectivity by standardizing on the Apple Filing Protocol (AFP). TOPS is an AppleTalk-based network.

NetWare, on the other hand, has an AFP-compliant module, which runs on Novell's proprietary local network. This feature, known as NetWare for Macintosh, gives Macintoshes access to the NetWare file server and personal computers access to Apple printer resources.

> LAN Systems' Rosen predicts that print-spooling products will eventually become part of the local net operating system.
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The approach of adopting other vendors' protocols and writing the local net operating system to connect to them has been popular. Novell has used this approach to develop NetWare for the VAX and is currently licensing its Portable NetWare to be developed for other computing platforms, including those from NCR Corp., Prime Computer, Inc. and Data General Corp., as well as the IBM VM (being developed by Phaser Systems, Inc.).

The other approach — using the TCP/IP protocols — is the most widely used and standardized method of linking dissimilar computer systems today. TCP/IP-based software transfers data from one computer to another, while a high-level program such as the standardized File Transfer Protocol manipulates the data. Although competing Open Systems Interconnection-based protocols are anticipated over the next few years, TCP/IP is still the protocol platform of choice for communications between dissimilar local nets.

LAN OS add-on products

Often, users want more features than the operating system provides. These features may be as simple as a pop-up window for assisting with network printing or as complex as a network monitoring product that keeps detailed information about every transaction in case of failure.

For example, five vendors offer third-party print-spooling packages that enhance NetWare's printing functions. These packages are Cybertek Computer Products, Inc.'s Network Assistant Plus; Brightwork's PS-Print; Netline, Inc.'s ManyLink; Fresh Technology Group's Printer Assistant and Print Q-Assist; and Network Management/LAN Services, Inc.'s LAN Spool.

LAN Systems' Rosen predicts that print-spooling products will eventually become part of the local net operating system.

"Printing in networks is getting sophisticated to match the minicomputer and mainframe systems for features, such as rewind, starting at specific pages and administrative functions," he says.

80386-based systems

Most of the current crop of local net operating systems is based on a 16-bit architecture, primarily the 80286 microprocessor. However, several local net operating system vendors have announced operating systems that support the 80386's improved architecture and performance power.

> Several local net operating system vendors have announced operating systems that support the 80386's improved architecture and performance power.
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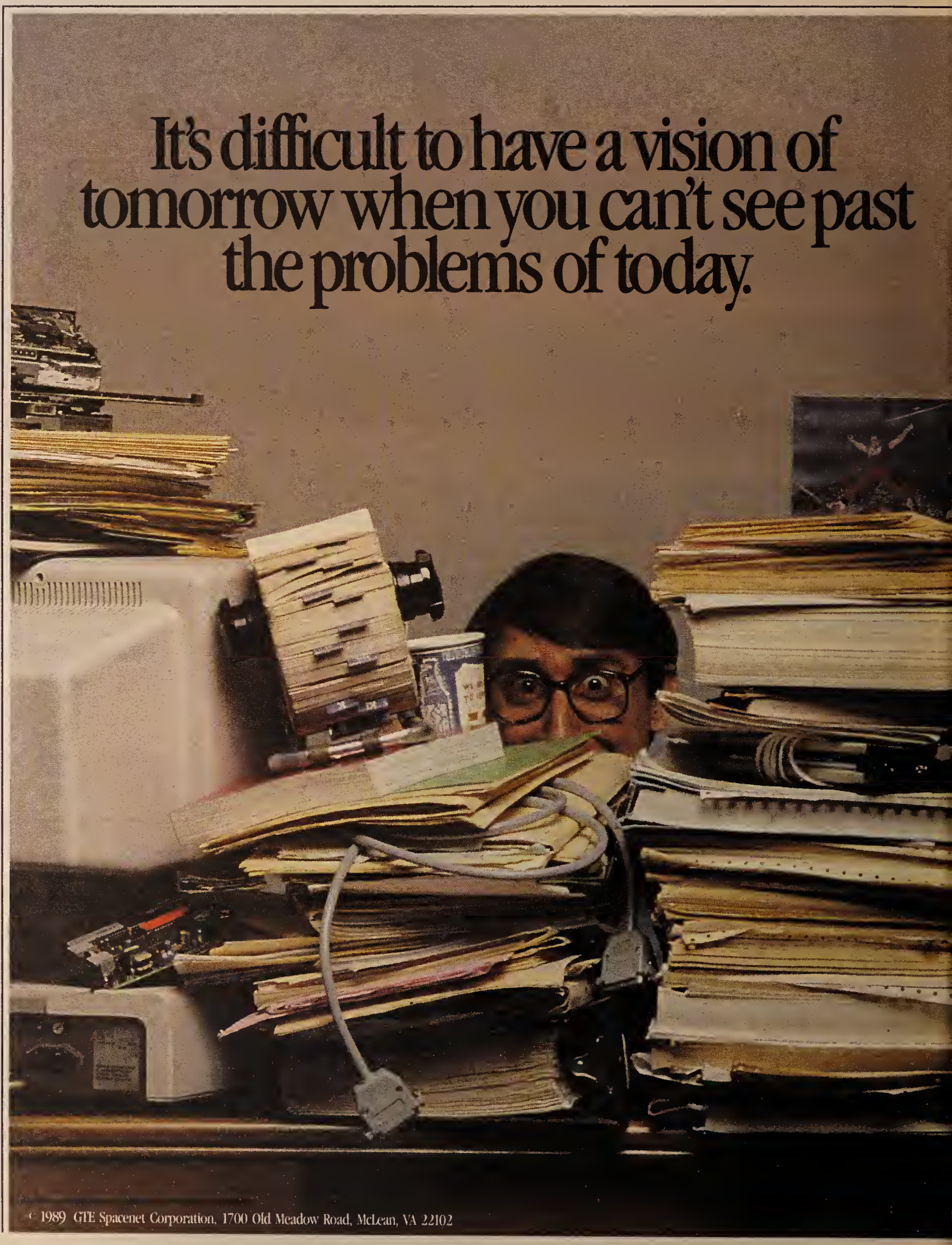
Over a year ago, Banyan Systems became the first large vendor to release an 80386-based local net operating system — VINES/386. In May of this year, Novell announced Versions 3.0 and 3.1 of its 80386 local network operating system, which are expected to be released by late 1989 or early 1990.

3Com's operating system will not support 80386 functionality until it releases OS/2 for 386 next year. An 80386 version



of OS/2 may be available by mid-1990. Until then, LAN Manager-based operating systems will continue to run in 16-bit mode on 80386-based personal computers.

These early 80386-based operating systems offer greater performance, speed and functionality than their 16-bit counterparts. They will take advantage of the 80386's 32-bit bus structure, the 32-bit data path and support of unsegmented, or flat, memory.

This last feature allows applications to operate more efficiently because larger blocks of data can be manipulated at one time and no overhead is associated with dealing with multiple segments. The 80386-based operating systems will also provide advanced networking capabilities, including support of very high-capacity drives, file server-based services, and global naming and directory systems.

Looking to the future

With the advent of new microprocessor-based local net operating systems, the range of functions that local nets can perform will be more powerful than ever before.

What is not clear is which local net operating system — whether proprietary or based on one of the existing operating system standards — will be the best choice for handling such challenges as vastly increased data transfer rates and multimedia applications.

The measure of how well a local net operating system will work with future technologies is whether it can incorporate other vendors' advancements and adapt to the introduction of new protocols.

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to upgrade France's telecommunications system from one of the least developed in Western Europe to a state-of-the-art system with which to lead Europe into the information age.

Thus, Minitel was a political and technology-driven innovation, rather than one designed around a perceived market need. The strategy of creating the low-cost Minitel terminals and giving them away was a direct response to the failure of British Telecommunications PLC's Prestel videotex service to achieve any meaningful consumer acceptance relying on purchased or leased equipment. In its initial stages, the Minitel strategy seemed to work, as traffic on the network grew impressively. From 15 million hours of use in 1985, connect hours rose to 73 million by 1988.

But the gross figures hide another story: Newly installed Minitels are heavily used, but usage falls rapidly in most cases. In France, telephone bills are issued bimonthly. Thus, many new users of Minitels who spent hours with popular chat services received a first bill as high as $1,000. They quickly moderated their use, returned the Minitel or began using the Minitel at the office. In 1987, nearly 40% of Minitels were either unused or used only to access directory services. According to one survey, more than half of those with Minitel terminals would return them if asked to pay a nominal leasing fee of as little as $2 monthly.

Minitel has not proven to be viable as a business. France Telecom does not expect Teletel to break even until 1994. Even that projection is based on a model that excludes research and development expenses prior to 1984. Minitel, which initially was promoted with the notion that it would be cost-justified by eliminating directory assistance and printed directories, is now projected to achieve only 7% of its revenue through savings in those areas.

Technically, Minitel is based on frame-by-frame information transmission; therefore, the intelligence of the system is in the network. Every time a user requests information, the entire frame must be transmitted, even if only one piece of content needs to be changed such as in a weather report. This method of transmission was essential to a strategy that used inexpensively produced ASCII terminals.

That approach also restricted display screens to ASCII characters. Services that used color and graphics, such as the U.K.'s Prestel and the failed U.S. services — Times Mirror Co.'s Gateway and Knight-Ridder's Viewtron — required expensive special-purpose terminals. Even then, each new information request by a user required the system to transmit a vast quantity of data.

On the other hand, Prodigy Systems, Inc. and Quantum Computer Services are using the intelligence of personal computers. They have created distributed file videotex platforms. That is, they rely on files loaded into the personal computers, which are downloaded during the session from a host computer.

In the case of Prodigy, the files are downloaded from minicomputers within the network. The minicomputers assume many of the duties traditionally performed by the large centralized computers previously necessary when using dumb terminals. This distributed file approach allows for superior videotex capabilities in the system at lower costs, primarily by lowering the transport cost and reducing host computer needs.

The French experience now raises concerns about the direction of U.S. videotex policy. Under the misconception that Minitel has provided substantial social benefits for French consumers, U.S. policymakers appear to be leaping to the decision to encourage the RBHCs to create the necessary net infrastructure and use their considerable financial resources to provide free or low-cost terminals to the public.

The telephone companies, interested in network usage, are likely to support frame-by-frame videotex. If we are not careful, the entry of the RBHCs could slow the coming of an era of distributed videotex, thus producing results that are the opposite of what public policy ostensibly seeks — the maximum public benefits from videotex diffusion.

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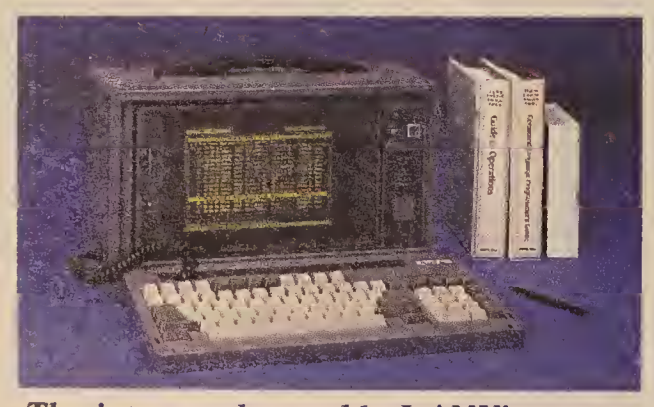

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Apocalypse now?

RBHCs as well as long-haul carriers are responding to the challenge of securing the public switched network from disasters.

The last of a two-part series on the vulnerability of the public switched network.

Despite a major earthquake in Los Angeles 2½ years ago, AT&T's long-distance network was able to cope with an explosion of panicky calling traffic into the area. AT&T's network managers reassigned circuits to calls outbound from Los Angeles, enabling them to reach their nationwide destinations while blocking a significant percentage of inbound calls.

During Wall Street's "Black Monday" stock market crash of October 1987, calling volume surged, yet the long-distance and local telephone services performed without a hitch, providers claim. New York Telephone Co., for example, was able to handle an 8.8% call volume overload without activating any network controls that would have rerouted around blockages.

Why?

The public switched network has demonstrated surprising resiliency. Why then, do some users and industry experts perceive a network with an Achilles' heel? Because of the Hinsdale, Ill., central office fire. No one can deny the damage it caused.

"When the Hinsdale fire occurred, we lost 85% of our data network," reports Patrick Murray, vice-president of MIS at Des Plaines, Ill.-based United Stationers, Inc., a $1 billion office products wholesaler. United Stationers recouped its network by moving operations to Chicago-based Comdisco Disaster Recovery Services, Inc.'s disaster recovery facility in Carlstadt, N.J., an arrangement planned in advance. Still, the company lost all its order entry business for 36 hours and suffered significant financial loss by having to pay alternate recovery site fees. Murray declined to give exact figures.

"Our trust level [in the public switched network] has deteriorated significantly," Murray continues.

Some critics argue that the Hinsdale incident occurred due to the smugness of the providers and the antiquated network topology they supported.

"Today's public network is still built using fixed routing and [primarily] physical star/hub network topologies, which are very vulnerable if hit," says James Conlisk, a transport architect for US West Advanced Technologies, Inc.

"Hinsdale was a burning bottleneck," claims Robert Annunziata, president of the World Teleport Association and also president and chief executive officer of Teleport Communications Group in Staten Island, N.Y. "It demonstrated what happened when the local exchange company had all its eggs in one basket."

However, "The [local exchange carriers] are beginning to move in the direction of route diversity," Conlisk says. "We're seeing the implementation of network topologies that exhibit route diversity," albeit in the embryonic stages, Conlisk says.

Telcos fight back

Both the regional Bell holding companies and the long-distance companies are taking survivability threats much more seriously these days.

Over the next five years, Ameritech plans to implement an $80 million Ameritech Network Protection Plan, which will provide alternate hubbing and route diversity to approximately 85% of its Chicago-area customers, according to Jay Krakora, senior director of operations planning at Ameritech Services, Inc., the planning unit for Ameritech's five telephone companies.

"We're providing diverse routes out of central offices so that systems are protected on a one-to-one basis," Krakora says. "We're also creating a dual hubbing arrangement in the Chicago area."

Philip Miller, director of switch requirements at Nynex Corp., says many of the RBHCs have a tougher job implementing network protection than the long-distance carriers. "AT&T has a less complex network than I have," Miller says. "I have 250 central offices just south of Poughkeepsie [N.Y.], whereas AT&T doesn't have nearly that many for its national switches. In addition, some of our COs have more than one switch."

Nonetheless, Miller claims that Nynex has developed a "gold-plated" network over the years, complete with several layers of routing protection as well as a sophisticated disaster recovery program. "We have always had alternate routes among end offices," Miller says. "We also have additional routings that can be accessed via implementation of network management controls for our 'out-of-chain' routing during disaster situations." Out-of-chain routing refers to routing that permits traffic from a failed tandem switch to be rerouted along different tandems that would ordinarily not handle that traffic.

Within the last six months, Nynex also implemented digital access and cross-connect switching systems to provide broadband fiber protection, as well as operation support systems to allow automatic disaster recovery service.

Herman Flaminio, director of fundamental planning, switching and facilities at Bell Atlantic Corp., says his company also has sophisticated protection in place and is in the process of developing guidelines to help local planners install diverse facilities routing where it doesn't exist.

In addition to stepping up the activities of a fire prevention and detection task force, the company is active in national security emergency preparedness, disas-

(continued on page 52)

Emmett is a free-lance writer based in Hewitt, N.J.

By ARIELLE EMMETT

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(continued from page 51)
ter detection and response and survivability issues.

Besides alternate fiber routing between central offices and the use of automatic protection switching systems, the company works directly with customers to develop alternate routing on a case-by-case basis. However, customers must pay for the extra service.

Darryl Johnson, a network manager at Southern Bell Telephone and Telegraph Co., says his company gears much of its network management strategies toward handling hurricane disaster. "Because much of the system in BellSouth [Corp.] is new, we are diversely routed and have dynamic routing in conjunction with the interexchange carriers," he says. The company has built several modern ring topologies in quickly growing southern cities and plans to implement Signaling System 7 (SS7) shortly.

Pacific Bell and Southwestern Bell Telephone Co. are also quite open about their network protection measures. Pacific Bell "designs the network in such a way that it can recover from a variety of disasters," says Diane Wentworth, a spokeswoman for the company. "We also work with customers to identify key circuits," which has enabled customers such as First Interstate Bank in Los Angeles to identify priority circuits and establish a secondary routing facility in another location.

"We also have fiber rings in two major metropolitan areas," Wentworth says. Fiber traffic in both Los Angeles and the San Francisco Bay area can be routed to an unaffected part of the ring in the event of a breakage. The company has diverse fiber routes along the Bay Area Rapid Transit (BART) Tube in San Francisco, as well as the major bridges in the area.

Pacific Bell's principal concern, however, is earthquakes. In California, company equipment is bolted to the floor with special anchoring pins developed for the nuclear power industry. Pacific Bell keeps four major emergency operations centers supplied and ready to go in case of earthquakes or other emergencies.

At Southwestern Bell, the accent has been on analyzing the network for traffic concentration, fire safety, building design and restoration plans, according to Charles Hotchkiss, the company's division manager for switching. The company is planning a multimillion-dollar program of network upgrades and recommendations to improve network architectures over the next three years.

William Rhine, director of services planning at US West, says his company is also studying Hinsdale, but he did not mention any specific programs to institute new network protections. "We have protections already designed and built into the network," he says. "We've got diverse routing, for example, but you have to look at the individual area to determine what the routing is."

"Local operating companies are still wrestling with their priorities," says John Schladweiler, vice-president of Business Development at Comdisco Disaster Recovery Services, which now holds the largest piece of the $200 million disaster recovery market for business users. "For example, with voice traffic, [the question is] who gets recovered first if there's a disaster — the fire department, local residences or the business community?"

According to Jim Cornelius, Bell Communications Research's assistant vice-president of distribution and interoffice technology and disaster response coordinator, "The degree to which the operating companies have designed diversity into their networks varies widely."

Richard Cardwell, BELLCORE's district manager of network management technology, says the RBHCs will take the shortest, most economical path to network improvements but will not revamp their networks simply to meet criticism.

Long-distance overloads

In contrast to the local operating companies, long-distance carriers are nationally visible companies, engaged in a heated postdivestiture war for customers. Modernizing the networks and providing customers with the assurance of redundancy and robustness is a top priority for them.

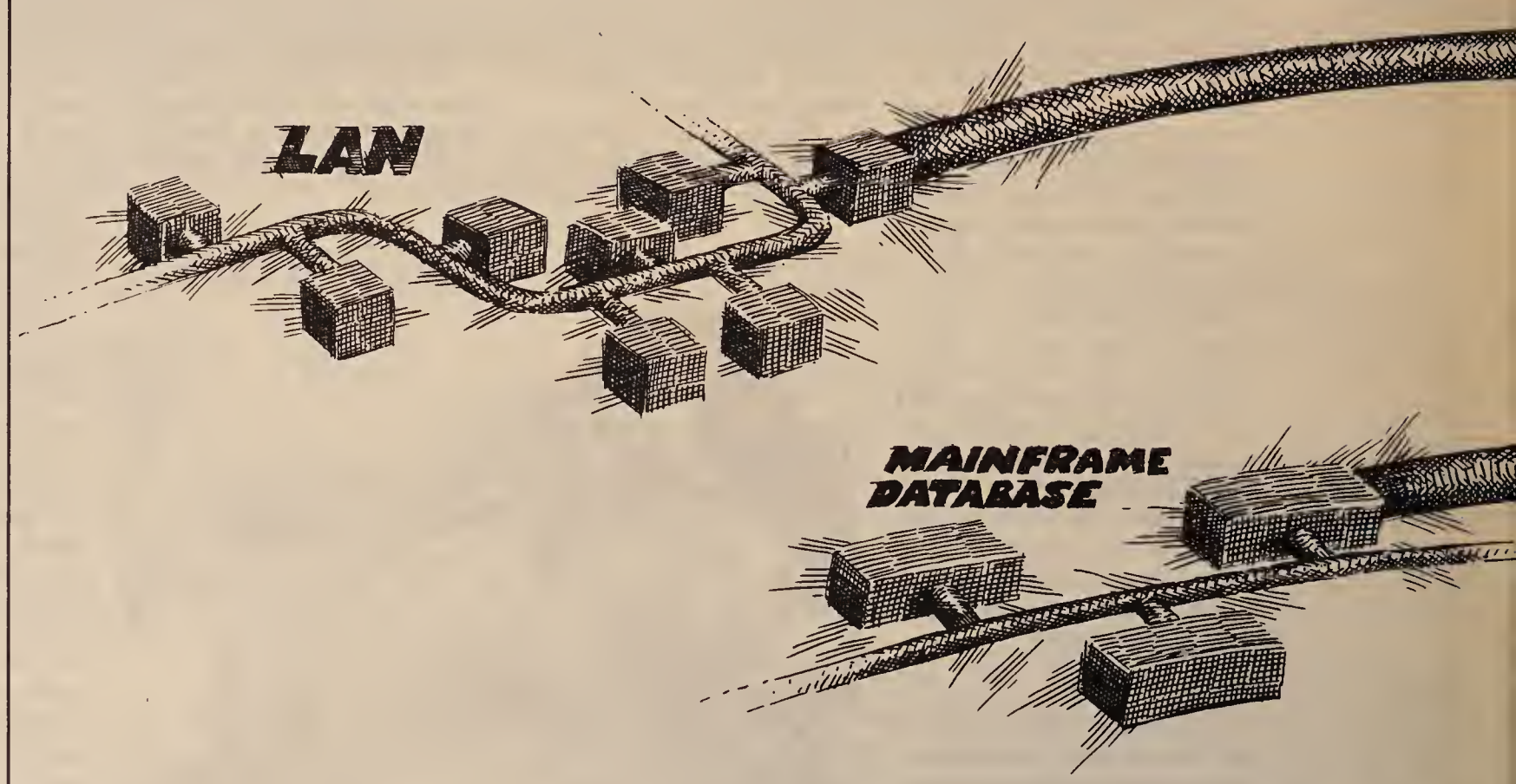
Each major long-distance carrier handles overloads differently. AT&T, for example, has been upgrading its long-distance network over the last few years to the tune of $8.7 billion. By the end of 1989, 95% of all AT&T's domestic switched traffic will be carried on digital facilities (41% fiber, 50% digital radio and 9% digital coaxial cable). By 1990, the figure will increase to 100%, and by 1992, all dedicated circuits will be digitized.

Among the innovations Rich Wolf, head of traffic network management planning at AT&T Bell Laboratories, cites is dynamic nonhierarchical routing (DNHR), a change in the logical architecture of the AT&T long-distance network that enables automatic rerouting of traffic along nonfixed paths.

Implemented over the last two years, DNHR is made possible through modifications in AT&T's 4ESS switches as well as a new, intelligent operations support software tool. The Network Management Operations Support System (NEMOS) searches the network for excess capacity and dynamically reallocates traffic to relatively uncongested switches.

NEMOS acts like a sophisticated network traffic cop, polling information from more than 100 AT&T 4ESS switches nationwide and feeding the information directly into the computers at AT&T's Worldwide Intelligent Network Operations Center in Bedminster, N.J. Calls can be completed along as many as 21 spontaneously configured network routes.

MCI Communications Corp. touts dynamic routing over an almost fully redundant network of digital and analog radios that is used during emergencies and in peak overload situations, says David Link,



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a vice-president of network engineering at MCI. In addition to the overlay radio network, Link reports that MCI's 95% fiber backbone network is constructed in a ring configuration with capacity reserved specifically for network restoration.

"If a link in a ring is severed, we could backhaul that traffic to the opposite side of the ring [and restore service]," Link says. MCI is also implementing fiber protection switching systems — a form of backup capability enabling the network to switch from one fiber channel to another — and has agreements to do "fiber swaps" with other carriers, such as Lightnet, Southern-Net USA, Williams Telecommunications Group, Inc. and Allnet Communications Services, Inc. to ensure network redundancy in the event of unforeseen outages, fiber cuts and overload situations.

US Sprint builds redundant capacity and oversized trunks into its all-fiber long-distance network, according to Bill Vest, the company's director of network fundamental planning. "Our fiber-optic network is configured in a series of nested loops," he says. "If the connection between a Sprint point of presence [POP] and local switch is cut, a reverse-direction protection switch will automatically send traffic on a DS3 basis around the network loop to the switch it needs to get to," Vest says.

"If we lose a particular fiber facility on an interim outage, the trunk groups affected have at least 50% redundancy and 50% capacity left," he continues.

This year, US Sprint has also installed more trunk groups than required to meet capacity requirements. To deal with focused overloads, he adds, "We have the same capabilities inherent in our digital switches as AT&T does. We can access the switches remotely and change the routing to get out of focused overload."

The difference, however, is that AT&T's operations support software can make switching changes dynamically, whereas US Sprint still requires direct human intervention. Vest says the company is developing alternate algorithms that may eventually be used to do routing dynamically.

Although some network managers claim their companies are already implementing a form of DNHR, Nynex's Miller declares they are not. "None of the Bell operating companies has implemented DNHR," he says. "AT&T has implemented a form of it, but nobody [really] understands how to implement it. Engineers have not been able to figure out an algorithm that would permit them to do normal trunk engineering with DNHR."

Sabotage and acts of God

Can the public switched network withstand the assaults of terrorists and acts of God?

"There's a line between normal failure scenarios and terrorist or World War III scenarios," according to a high-ranking U.S. telecommunications official who asked not to be identified, and who is also a former member of the National Communications System, a government group that designs plans to ensure emergency telecommunications preparedness. The failures on the extreme side require "a different set of people and a different set of plans," he says.

Jim Nelson, a district manager at the AT&T Worldwide Intelligent Network Operations Center, says the company has emergency preparedness plans that will go into effect if a major earthquake or other disaster occurs.

"Some of our switch locations are what we call hardened sites," Nelson says. "They are equipped to withstand certain amounts of shock, and we have shock monitoring equipment on [many] critical routes."

In May, however, an AT&T 4ESS switch failed in Atlanta because of a power failure, causing loss of long-distance service to users in Georgia, Tennessee, Alabama and Kentucky. Battery backup to the switch also failed.

"The people served from that switch had no other alternative to get into the AT&T network, even though it was one of the DNHR central nodes," Wolf says. "We're trying to remove the last cases where a single switch failure can affect service to individual customers." Still, Wolf acknowledges that there are AT&T switches out in the field that have no "buddy" or redundant mate. The company, he says, is now engaged in a "buddy egress" program to correct that problem.

Signaling

Redundancy and vendor interoperability are also prime issues when it comes to common channel signaling, which, critics point out, is especially vulnerable to a concerted terrorist attack. "The concentration of the signaling software and hardware into a subnetwork means greater vulnerability than if the signaling function were spread throughout entire networks," says John McDonald, a senior vice-president of Contel Corp. and chairman of the Committee on Review of Switching, Synchronization and Network Control in National Security Telecommunications (part of the National Research Council).

Both the long-distance carriers and RBHCs adamantly deny that the nation's advanced signaling network is vulnerable to terrorism. "We've done studies of the [Common Channel Signaling] network and concluded it's highly reliable," BELLCORE's Cornelius says. "The system is appropriately designed with separate signaling paths that are redundant and highly reliable."

AT&T's CCS system is too security conscious to allow a rapid takedown of its signal transfer points (STP), according to David Nelson, supervisor of AT&T's signaling network planning group.

"We have 10 regions, each of which is served by two separate and completely independent signaling centers. Each center is redundant both with the other and unto itself, in that there are multiple processors

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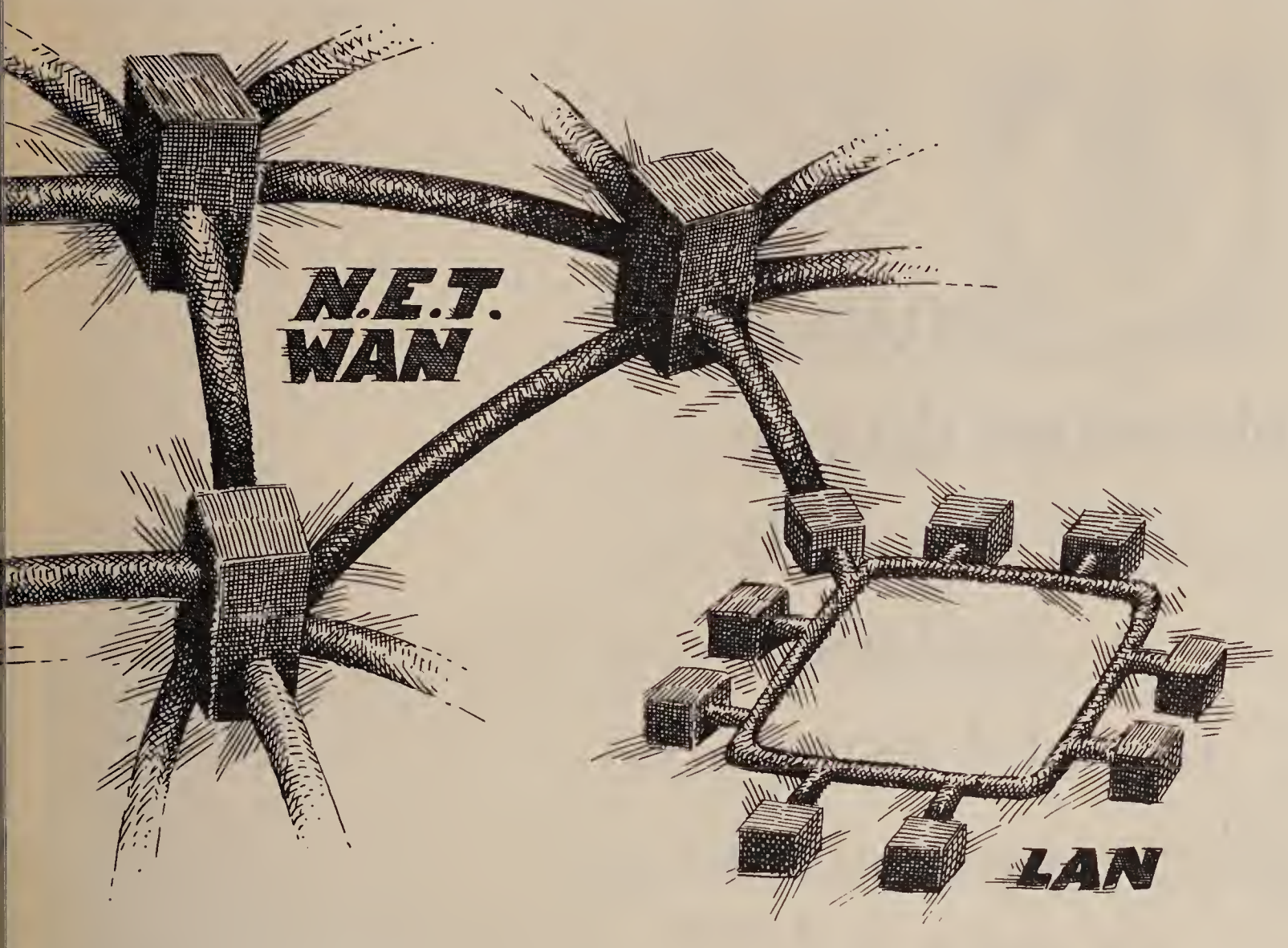

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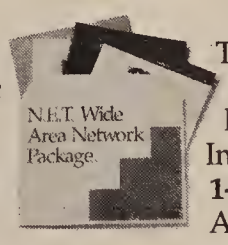

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In their recent *Audience Survey of Communication Networks '89*, Exhibit Surveys asked the following open-ended question:

"What publications do you read regularly (at least 3 out of 4 issues) to keep up to date in your field?"

Though more than 100 different publications were mentioned, only one publication won!

NETWORK WORLD

The Newsweekly of User Networking Strategies

Volume 6 Number 26 An IDG Communications Publication July 3, 1989

Token-ring users sound off to OTF

By Gail Ramsay
Washington Correspondent

WASHINGTON — Leading token-ring network users last week told vendors on the Open Token Foundation (OTF) that they should work harder to ensure interoperability of products.

Top technical executives from American Airlines Inc. (AA) told Bruce Hajj (manager of Sabre Labs) and Sheldon Gold (a senior staff member) that OTF members must bring products to market, provide better technical support and cooperate in producing an interoperable system.

Some also talked how IBM is qualified to properly test products that it sells.

Ron Brandenburg, senior vice president of technology at AA, urged vendors to put aside their differences and work together to provide services problems as multivendor

(continued on page 6)

Transport Canada devises distributed processing plan

By Paul Desmond
Special Writer

OTTAWA — Transport Canada last week detailed plans to migrate its IBM SNA network to a distributed IBM net based on an X.25 backbone supporting hundreds of minicomputers.

Faced with strong processing demands on its IBM network and decreasing funds and staff, Transport Canada — the Canadian equivalent of the U.S. Department of Transportation — needs a plan to ease the burden on mainframes by distributing processing to 600 or more mid-range processors.

The minicomputers will run a network of data circuits by gaining the common elements from versions of the operating system backed by the Open Software Foundation (OSF), which is spearheaded by IBM and Digital Equipment Inc., which is led by AT&T.

The project, estimated to cost $210 million over five years,

(continued on page 19)

Sikes gets Bush nod to fill top FCC post

Nominee says his first task as chairman will be to set national telecommunications policy goals

By Matt Yost
Washington Bureau Chief

WASHINGTON, D.C. — After weeks of anticipation, President Bush last week nominated Alfred Sikes to fill the top spot on the Federal Communications Commission.

It was originally expected that Sikes would be nominated in July, more than two weeks ago when Bush named Andrew Barrett and Sherrie Marshall as FCC commissioners. Speculation that Sikes would be named to the post began in earnest in February.

Sikes currently serves as assistant secretary for communications and information in the Department of Commerce and administrator of the National Telecommunications and Information Administration (NTIA).

While White officials have set no firm deadline for Sikes' confirmation by the Senate, they have indicated that the process should be completed before the August congressional recess.

In an interview with Network World last week, Sikes said that if confirmed as chairman, his first goal would be to evaluate the telecommunications policies and set national policy priorities.

Communications services are increasingly central to our economic and social progress and I think we need a clear set of national goals," he said. Ultimately, that would alleviate the regulatory gridlock between the FCC and Congress.

Sikes said he believes regulators have focused too much attention on plain old telephone service rather than evaluating how new technologies could be used

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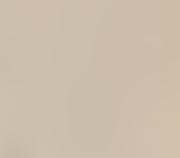


FCC nominee Alfred Sikes

UB LAN plan halts users' wiring work

By Bob Brown
Senior Writer

In the wake of Ungermann-Bass Inc.'s pledge to support 10Mbit/sec token ring local area networks on unshielded telephone wire, many users wiring projects have ground to a halt.

The ability to use unshielded wire to support high-speed local networks, rather than the shielded twisted pair (STP) required by current IBM token ring networks, will enable users to install the less expensive media with the knowledge that it can accommodate most future needs.

Ungermann-Bass, however, has yet to release pricing information for the components that enable its Access/One wiring concentrator to support 16Mbit/sec on unshielded wire leaving users and consultants wondering

(continued on page 8)

NETLINE

TOP 15 SPRINT EMC sales figures and may be integrated into the carrier's new operations. Page 2.

AT&T CUTS RATES for 56kbit/sec services, 30% across the board. Page 2.

N.Z. TEL SCORES A FIRST with the introduction of local frame-relay service. Page 4.

EUROPEAN COMMISSION tries to loosen state monopoly hold on certain value-added network services. Page 4.

STRATUS REACHES INTO the DEC environment. Page 1.

3COM WINS BIG with LAN Manager deal. Becomes standard for new versions of software. Page 6.

NEC AMERICA OFFERS a network management system that will eventually control a wide range of products. Page 6.

NEWSPAPER

FEATURE

Toll-free services market set for explosive growth

By Thomas Osborne
Special to Network World

Since AT&T introduced 800 service in 1967, toll free numbers have become an integral part of business. The market will grow from $5.1 billion this year to $6.8 billion in 1992, says Steve Reynolds of Link Resources Corp., a New York market research firm.

Large and small companies alike can benefit from today's 800 services. The base fee for an 800 line has dropped to as low as $2.75 per month. That's less expensive than call waiting.

With new features and capabilities on the way, it will soon be hard to imagine how users ever got along without 800 service.

The public is also getting more accustomed to 800 numbers. More than 50% of all consumers used an 800 number at least once last

(continued on page 28)

(continued from page 53)
that can handle the function even within a single center," he explains.

MCI's three pairs of redundant SS7 STPs are also extremely well-protected, according to MCI's Link. "Every switch in our network is connected to at least two of three pairs, and each is also connected to the mate in the pair; so each switch is connected to four STPs, in effect. We'd have to lose four STPs to lose a switch," he continues.

US Sprint's Vest, however, suggests that worries about CCS vulnerability could be well-founded. His own company, for example, has only three mated pairs of SS7 switches for the entire US Sprint network. If the out-of-band signaling switches were destroyed, "you'd certainly have the capability to go back and use inband signaling for those trunks for which you still have multifrequency receivers," he says. "But [worries about SS7] are valid in that it would be damaging if you lost all of those locations at one time. It would, however, take a coordinated act of sabotage to do that."

Daniel Briere, president of TeleChoice, Inc., an Alexandria, Va.-based industry consulting firm, argues that deliberate attack is not the only problem with SS7. "SS7 is a complicated animal, and all of the carriers are bringing up SS7 at different levels," he says. The complexity of the signaling system and the unwillingness of carriers to cooperate and exchange information have made implementations more difficult, and signaling snags and disaster recovery problems more likely.

According to Briere, any carrier that has a mixture of SS7 and other signaling systems should have two cutover plans in place and two disaster recovery plans. "SS7 lines can only recover to SS7, while analog lines can only recover to analog lines," he says.

Metropolitan-area bypass, teleport companies and disaster recovery firms claim they have an answer to these problems: diversified routing. According to Teleport Communications Group's Annunziata, "Disasters are unavoidable. But by having two diverse networks, customers are assured a link."

Gail Charles, director of marketing at McLean, Va.-based Institutional Communications Co., a specialized carrier that provides alternative local transmission services in the Washington, D.C. metropolitan area, says, "We lease conduit from the Bell operating companies, and we own the fiber. With that, you get higher reliability and security, and we are virtually immune from tapping."

While some users today are implementing bypass to long-distance POPs, others are opting to sign on more than one carrier on a steady basis as a backup in case one of the networks fails. Still others are choosing private disaster recovery services or they are opting for hybrid networks composed of both public-switched and dedicated circuits.

Whatever the options, consultants warn there are reasonable — and excessive — ways to exercise caution. "My advice is to pay only what [your telecom service] is worth to you," says TeleChoice's Briere. "Make sure your calls are routed over different lines. A lot of companies lease fiber from one another. You may go from your premises to an MCI POP and to an AT&T POP, but you could be traveling over the same facilities out of there."

John Powers, a principal of Powers Tritsch & Associates, Inc., a Wellesley Hills, Mass.-based consulting firm specializing in contingency planning and user auditing for disaster recovery, advises users to nail down such issues as network fallback, redundancy, supervision and restoration activities when negotiating with a carrier for service. "Contractually, you could word an agreement in such a way that you would have some level of recourse if you could prove that [restoral or disaster recovery] actions were irresponsible on the vendor's part," he says.

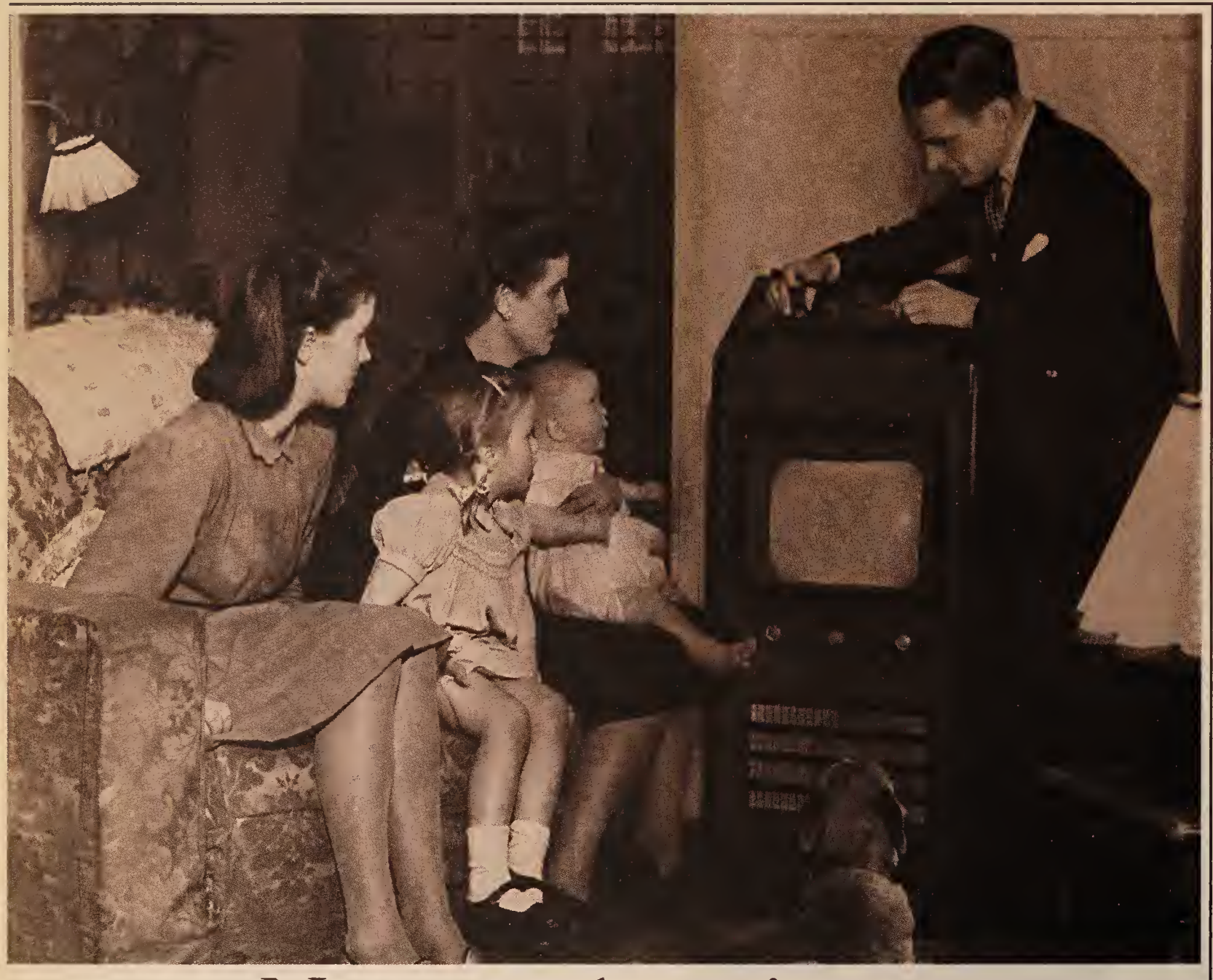
Many users have already opted for multiple carriers. However, Powers says, "You should find out how the carriers would be able to absorb the increased traffic load should you have to switch over. You may not have time to wait for a carrier to fix what was broken, but you could use a software instruction to swing over your network traffic [to a working carrier]."

Both Powers and Briere stress that hybrid networks ultimately may be a safer bet than using all-switched or all-private circuits. "If you've got a private line and problems occur, you've got to physically reconnect the circuits," Briere says. "The public switched network will overflow to other lines when circuits go down; private lines don't do that unless the carriers set it up that way."

Powers adds that bypass is one alternative users can try as a backup or diverse routing option along the local loop. The long-distance carriers are interested in direct bypass that enables users to tie in directly with their own POPs.

Jeffrey Kaplan, director of networks and professional services for The Ledgeway Group, Inc., a Lexington, Mass.-based research organization, suggests that user distrust may continue to fuel alternative telecommunications services. "The networks are becoming much more critical elements in customers' information processing environments," he says. "Customers are less tolerant of any network failures and any downtime. They want the technology to be more reliable, and they want vendors to be more capable of responding quickly."

The Hinsdale incident "showed everybody in the business how vulnerability can occur and occur logically over time through a series of economically-inspired engineering decisions," says a government spokesman who requested anonymity. "Hinsdale has caused people at last to put individual decisions into broader perspective given the available technologies. It was, in its own way, a highly desirable event."



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G4 DIGITAL

Pro

continued from page 39

tire country of France, it would seem that Nynex Corp. has equal or greater subscriber power than France Telecom. So with the exception of the inter-local access and transport area and equipment manufacturing restrictions, it is difficult to accept the notion that France Telecom has some specific edge over the American regional Bell holding companies, much less over AT&T, in developing new services.

The edge France Telecom has is a winning formula. The Teletel network and its kiosk gateway, combined with the Minitel terminal, give users easy and efficient access to services while offering information service providers access to users. The network automatically bills users on behalf of information service providers, removing the necessity for users to presubscribe to services; they can easily browse 10,000 different services.

The Minitel terminal — with its simple videotex function keys and inexpensive, compact and integrated design — proved to be a very good human interface for the end user. Together, the interface and the network engendered a new industry and a successful formula that can be duplicated in the U.S.

The Teletel network, in its role as both inexpensive carrier and billing agency, opened the door to information entrepreneurs. These entrepreneurs pursued the market with astounding vigor by continually offering new host products and interactive services. The result is a market that is, by American standards, extraordinarily decentralized and competitive.

There are hundreds of host operators and thousands of service sponsors all vying for consumer attention with increasingly valuable and entertaining services.

The Minitel and Alex terminals give the non-computer-literate person full access to the network and its services. Function keys such as PREVIOUS and NEXT allow the user to navigate easily through the page-displayed services. Once users learn this simple interface, no instructional manual is required for them to use any of the 10,000 services available in France and the 350 services available in Montreal. Which graphical standard is implemented is not important, but the navigation keys are critical. The Alex terminal uses the same function keys as the French Minitel, but it employs superior NAPLPS graphics.

This easy-to-use human interface has been specifically designed to provide the novice user with access to powerful on-line services. In France, the terminal is given free to users. In Montreal, the terminal costs $7.95 per month. Either way, the network operator is responsible for terminal distribution as well as billing for service access.

Clearly, personal computer owners are not the mass market, and scrolling ASCII services are not videotex. Videotex is accessible by people who don't own computers; it is displayed in pages, and the average person needs no manual or training to immediately use a videotex service. A dedicated videotex terminal incorporating the proven Minitel navigation command keys should be made available by gateway operators to all potential users within the gateway's area.

Finally, the videotex mass market in France is affecting every French business because those businesses can now service customers right in their homes and offices. Due to its vision and progress in coordinating the new videotex industry, France is in the vanguard of a big postindustrial revolution. The essence of the successful French formula — the advanced network and the user-friendly interface device — provides an excellent model that can and should be translated to the U.S. market.

Letters

continued from page 39

understand the mechanism by which it operates. Often, new technological advances are not well documented, and when they are, the necessary information is difficult to find.

I have found, however, that this is not the case with IBM's ILU implementation. IBM has published no less than a dozen manuals that explain (in various levels of detail) how ILUs work. Of particular interest is IBM's "Systems Network Architecture Type 2.1 Node Reference" publication, which contains references to other relevant publications.

Additionally, IBM offers a two-day class, titled "ACF/VTAM, ACF/NCP New Release Enhancement," which devotes an entire day to low-entry networking (PU 2.1) and ILUs.

Therefore, to solve the puzzle of ILU support, one has only to understand the specifications published by IBM and apply those specifications to the implementation in question.

Joseph Rumolo
SNA consultant
Computer Networking
Resources, Inc.
Highlands, N.J.

Author's response: Mr. Rumolo writes that the answer to the question I posed is easily available yet, incredibly, he does not state it. Accordingly, I challenge him to provide the answer to the question: "What specifically indicates to the Network Control Program and VTAM that the node it is communicating with is PU 2.1 and not PU 2.0?"

Recall that many IBM specialists have provided me answers to this question and they all were wrong.

If Mr. Rumolo cannot provide a "speedy, correct" answer to this question, then I rest my case. Otherwise, I owe him a beer.

Joe Mohen
SNA consultant
New York

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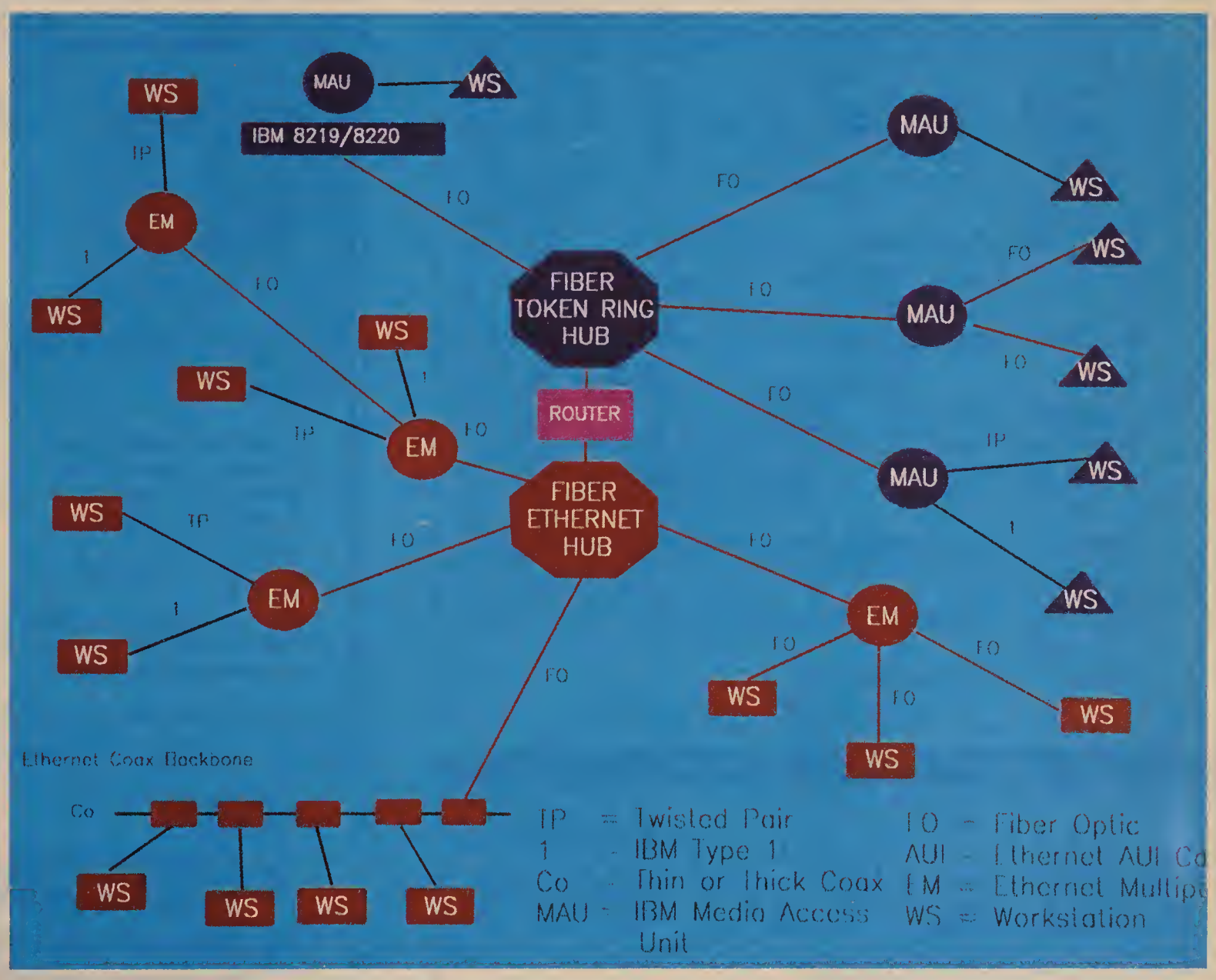

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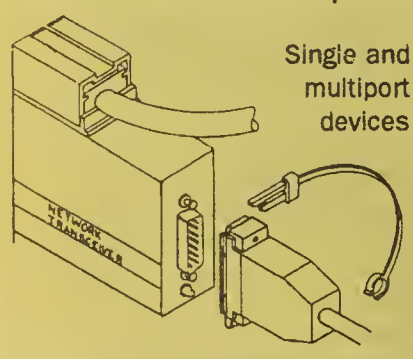

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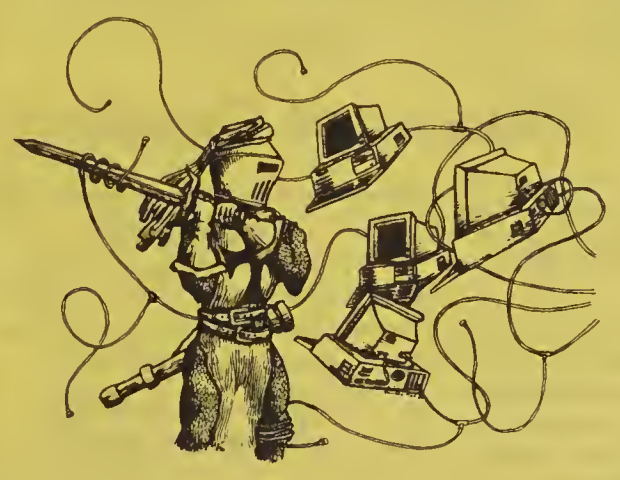

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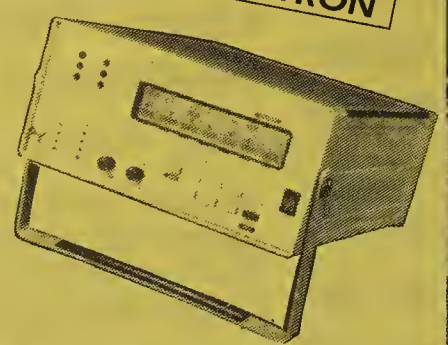

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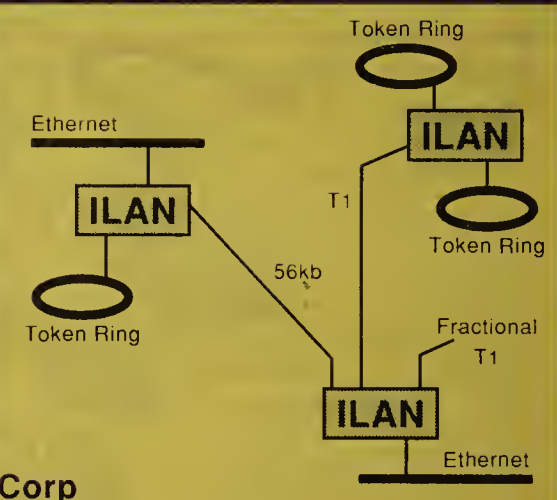

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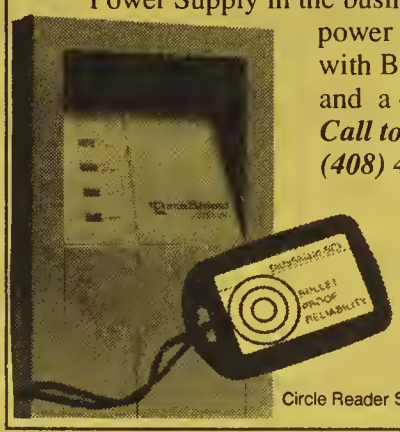

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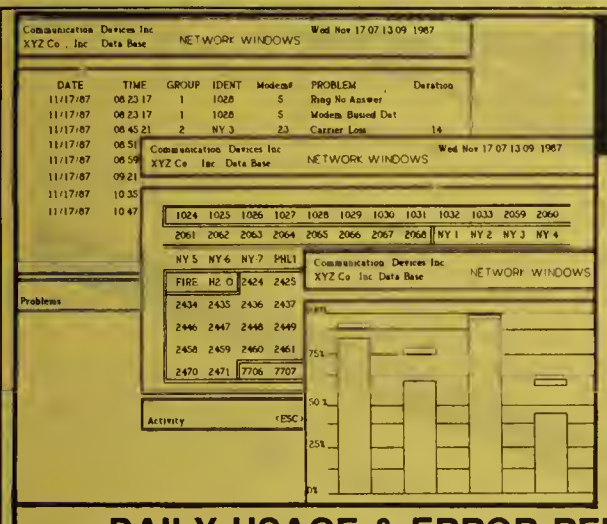

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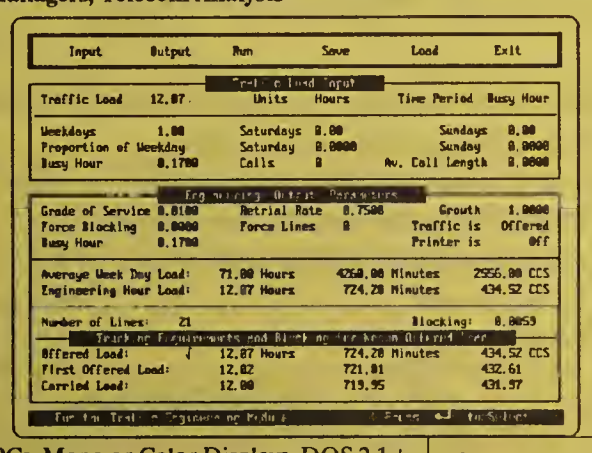

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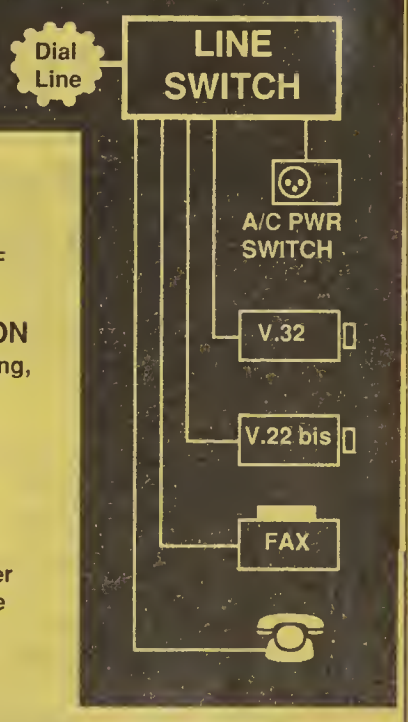

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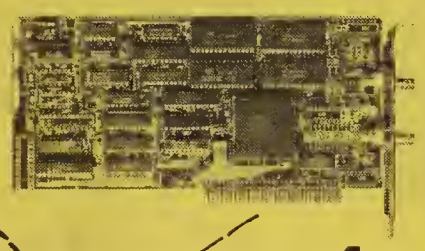

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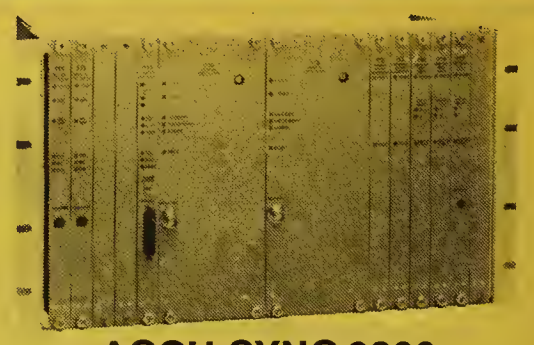

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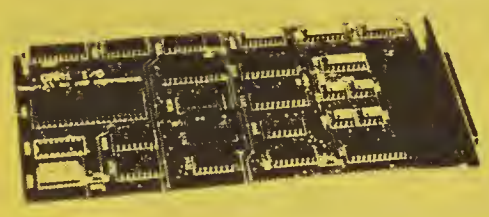

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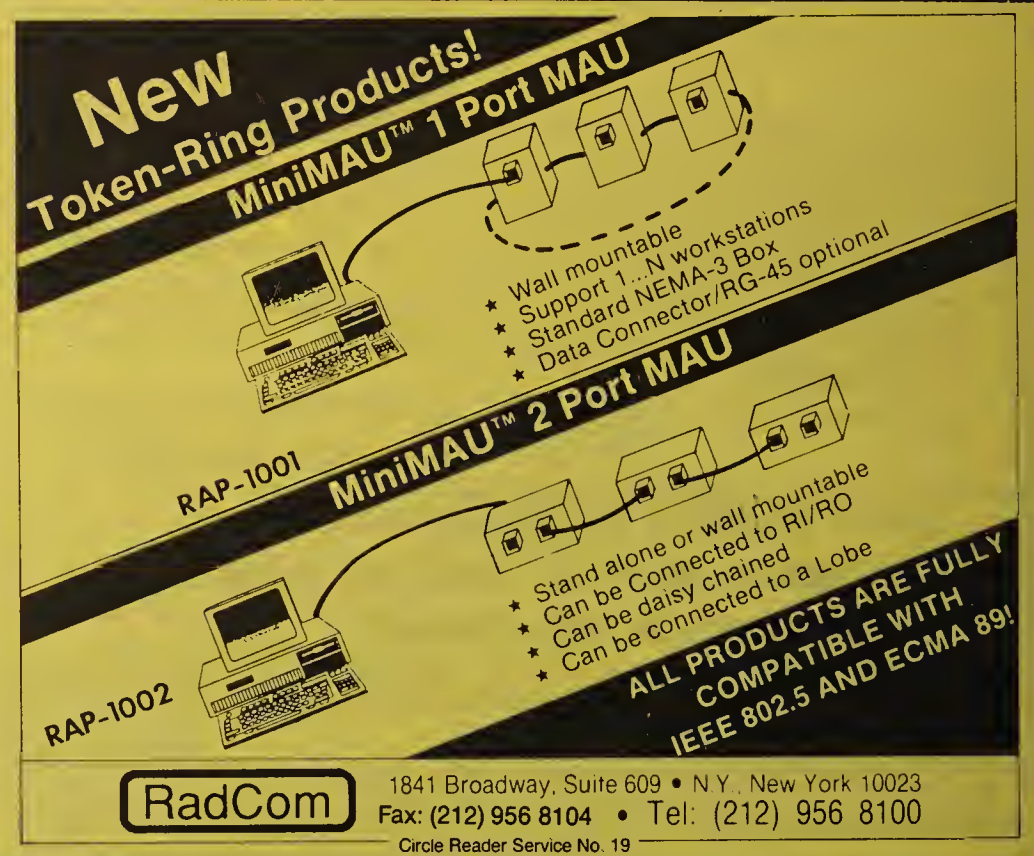

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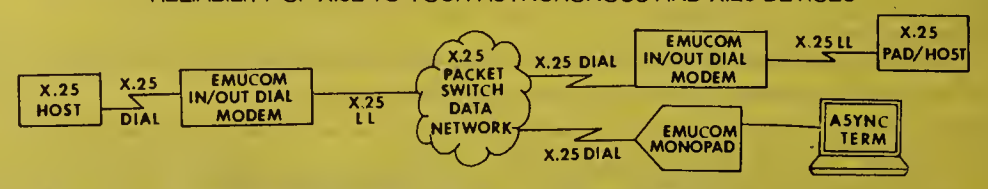

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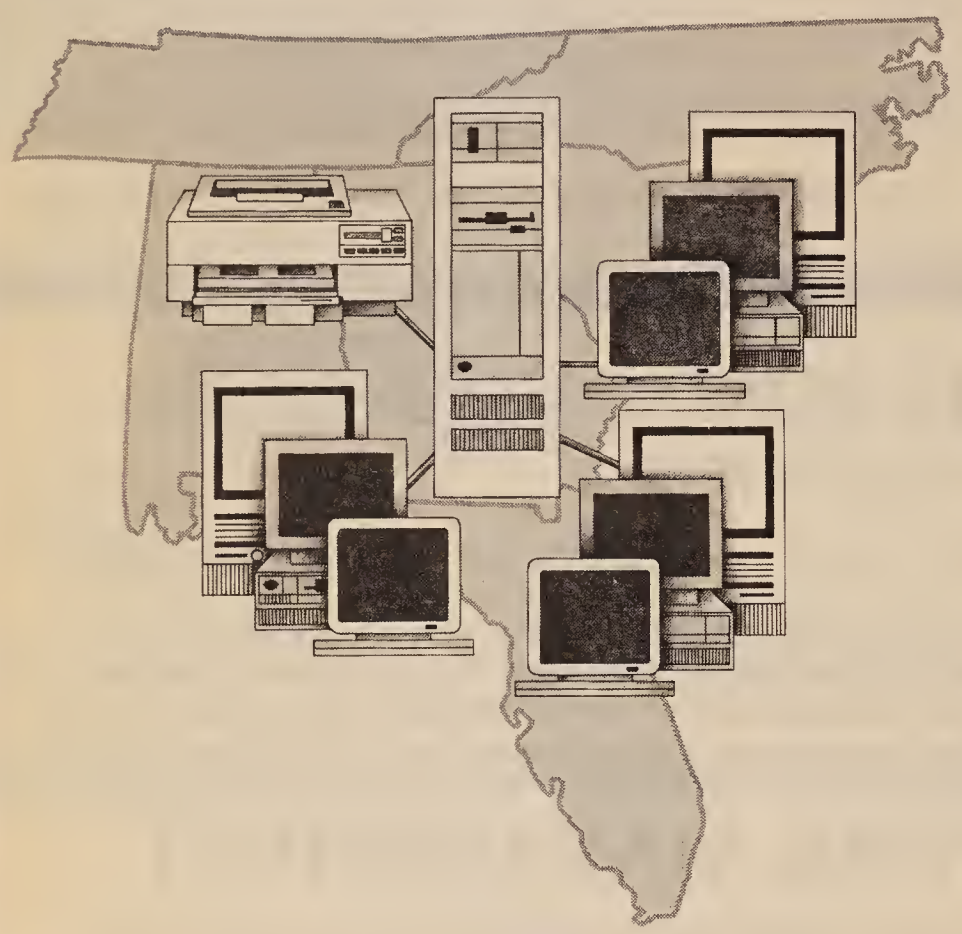

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3. How much does your company plan to invest in LAN equipment or services within the next 12 months? (check one):
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2. ☐ $10,000 - $25,000
3. ☐ 25,001 - $50,000
4. ☐ $50,001 - $100,000
5. ☐ $100,001 - $250,000
6. ☐ $250,000 - $500,000
7. ☐ $501,000 - $1,000,000
8. ☐ Over $1,000,000

4. Number of employees in your company: (check one)
1. ☐ Under 25
2. ☐ 25 - 50
3. ☐ 51 - 100
4. ☐ 101 - 200
5. ☐ 201 - 500
6. ☐ 501 - 750
7. ☐ 751 - 1,000
8. ☐ Over 1,000

5. Number of employees in your company at your site: (check one)
1. ☐ Under 25
2. ☐ 25 - 50
3. ☐ 51 - 100
4. ☐ 101 - 200
5. ☐ 201 - 500
6. ☐ 501 - 750
7. ☐ 751 - 1,000
8. ☐ Over 1,000

6. Number of workstations or PC's to be networked at your site: (check one)
1. ☐ 5 - 10
2. ☐ 11 - 25
3. ☐ 26 - 50
4. ☐ 51 - 100
5. ☐ 101 - 200
6. ☐ 201 - 500
7. ☐ 501 - 750
8. ☐ Over 750

7. Approximate dollar sales volume: (check one)
1. ☐ 0 - 100,000
2. ☐ 100,001 - 500,000
3. ☐ 500,001 - 1 million
4. ☐ 1.1 million - 5 million
5. ☐ 5.1 million - 10 million
6. ☐ 10.1 million - 15 million
7. ☐ 16 million - 50 million
8. ☐ Over 50 million

8. Do you personally authorize the purchase of LAN equipment?
☐ Yes ☐ No

9. In which ways are you involved in acquiring communication products (data, voice, and/or video) and services. (check one)
1. ☐ Recommend/specify
2. ☐ I specify/evaluate potential
3. ☐ Approve the acquisition
4. ☐ None of the above

To avoid processing delays, please include your $20 registration fee with your completed form.
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June 29, 1989

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IBM adds TCP/IP support to AS/400

continued from page 1

Analysts welcomed support for TCP/IP, saying it gives AS/400 users greater multivendor networking capabilities. But they questioned whether it will boost AS/400 sales.

"TCP/IP is generally used in the scientific and engineering community, and most AS/400s are used in commercial business environments," said David Passmore, a partner at Network Strategies, a consulting practice of Ernst and Young in Fairfax, Va.

Passmore said commercial users generally don't require TCP/IP, although demand for it is beginning to accelerate as users adopt TCP/IP as an interim standard while Open Systems Interconnection protocols emerge.

IBM is supporting TCP/IP through an internally developed software package dubbed AS/400 TCP/IP Connectivity Utilities, which runs on the AS/400. It includes support for TCP/IP's File Transfer Protocol, Simple Mail Transfer Protocol and program-to-program communications through TCP and User Datagram Protocol (UDP). UDP, like TCP, also works with IP for internetwork communications but is less reliable because there is no error-reporting mechanism.

IBM announced that it intends to support the TCP/IP Telnet virtual terminal protocol, but the company did not commit to a delivery date for that support. If the AS/400 supported Telnet, terminals or workstations attached to non-IBM hosts that supported Telnet could log on to the AS/400 without using a terminal-emulation package.

IBM said it tested compatibility of its product with TCP/IP implementations on IBM RT Personal Computers; Personal System/2s running AIX, System/370 VM and MVS; and on equipment from Digital Equipment Corp., Sun, Hewlett-Packard Co. and its Apollo Division.

8209 LAN Bridge

AS/400 TCP/IP supports TCP/IP traffic on IBM Token-Ring, Ethernet Version 2 or IEEE 802.3 local nets. To communicate from an AS/400 on a Token-Ring to either version of Ethernet, users need the IBM 8209 LAN Bridge, IBM's first Token-Ring-to-Ethernet bridge, also announced last week.

The 8209 connects a 4M or 16M bit/sec IBM Token-Ring with Ethernet Version 2 or 802.3 local nets and handles all the protocol conversion necessary to route data between the local nets.

The bridge is not specific to the AS/400 TCP/IP product announced last week but can be used for any Ethernet-to-Token-Ring application. It is a stand-alone device that sits between the Ethernet transceiver and an IBM 8228 Multistation Access Unit that connects devices on IBM Token-Ring Nets.

For 802.3 nets, the bridge supports multiple protocols including TCP/IP, OSI, Systems Network Architecture and Network Basic I/O System. With Ethernet Version 2 networks, it supports only TCP/IP.

The 8209 supports a source routing algorithm on the Token-Ring side and the Spanning Tree Protocol on the Ethernet side to ensure that there is only one data path between any two stations on the local net, according to Ed Rowlance, lead engineer for the 8209 LAN Bridge.

Apparently, the 8209 is only a short-term solution for tying Ethernets to the AS/400 because IBM announced a statement of direction to provide support for Ethernet within the AS/400 itself, although it declined to disclose when that support would be available. The AS/400 already supports Token-Ring Nets in this native mode via an interface card and thus can support TCP/IP traffic over Token-Ring Networks without the 8209.

AS/400 TCP/IP is scheduled to ship in March 1990. It ranges in price from $3,410 to $23,880, depending on configuration.

The 8209 LAN Bridge is slated to ship Oct. 20 and costs $6,265. In addition, a mandatory Ethernet Attachment Module costs $935. Rowlance said the attachment module provides the Ethernet interface, whereas the Token-Ring connection is built into the product.

That leaves the door open for the 8209 LAN Bridge to support other modules in the future — such as X.25, Manufacturing Automation Protocol or Fiber Distributed Data Interface networks — although Rowlance would not say whether IBM has such plans.

Last week, IBM also announced:

- ASCII workstation controllers for AS/400 Models B30 and above. Previously, ASCII controllers were available only for low-end Models B10 and B20. Each controller supports the attachment of up to 18 ASCII displays and printers. The high-end AS/400 supports up to 20 controllers.
- Extension of the AS/400's PBX links to include the 9751 CBX family. Previously, the AS/400 supported only Redwood CBXs. Support for Redwoods has also been expanded to include the new 9722 Redwood Model III announced last month. Functions supported include computer-assisted dialing and call detail record collection.
- AS/400 Personal Computer Support Release 2, which extends the functions of IBM's Personal Computer Support program to include workstations running OS/2 Extended Edition Version 1.2. Personal Computer Support gives microcomputers access to AS/400 applications, data bases and peripherals.

Under the new release, Personal Computer Support can provide functions such as file transfer and messaging between an AS/400 and both DOS- and OS/2-based workstations simultaneously. Release 1 of the software supported only DOS-based workstations.

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Novell, Sun work toward Remote Procedure Call interoperability

NetWare and NFS users will be able to share applications.

By Laura DiDio
Senior Editor

DALLAS — Novell, Inc., Sun Microsystems, Inc. and Netwise, Inc. tomorrow will announce an effort to create a software development tool kit that can be used to build distributed applications.

Under the agreement, Netwise will engineer a new release of its RPC TOOL developer's kit that will support Sun's RPC Library and Remote Procedure Calls (RPC) used by Novell. Novell resells the existing tool kit as the NetWare RPC.

The tool kit will enable software developers to write distributed applications that can be run across processors in Novell NetWare and Sun Open Network Computing/Network File System environments.

Several leading software developers and systems vendors — including Data General Corp., Lotus Development Corp., Prime Computer, Inc., Oracle Corp., Sybase, Inc., Unisys Corp. and Wang Laboratories, Inc. — will announce support for the plan.

Novell and Sun declined to comment on tomorrow's press conference, saying only that it will address "joint cooperative efforts in distributed applications." However, internal documents obtained from both companies confirmed the announcement.

An interesting wrinkle to the announcement is that the new version of RPC TOOL will be independent of transport protocols. As a result, programmers will be able to write applications to one common application programming interface without worrying about which underlying transport protocol was used, sources said.

That feature will make RPC TOOL especially attractive to software houses that have traditionally called for a common application program interface so they wouldn't have to rewrite applications for use with different protocols.

"The development of a common RCP will make the issue of the underlying transport protocols, like TCP/IP, NETBIOS and Novell's [Internetwork Packet Exchange/Sequenced Packet Exchange], a moot issue for software developers and end users," said Mark Hatch, vice-president of marketing at Netwise and formerly manager of Apollo's Network Computing System.

Lee Doyle, senior analyst and manager of local network research at International Data Corp., a market research firm in Framingham, Mass., said, "One impact of the RPC TOOL will be to enable NetWare users to access the distributed applications already available for Sun's Unix-based workstations. All this is made possible by using a common RPC."

Sources close to Novell and Sun last week said Banyan Systems, Inc., which has had its own RPC technology since 1983, has been invited to participate in the development effort.

Banyan President David Mahoney declined to divulge whether his firm would participate with the other companies in reworking RPC TOOL. However, Mahoney said, in the long term, RPC TOOL will simplify and reduce the cost of developing applications for multivendor environments.

"The LAN industry needs standardized RPCs, and this is a big first step," Mahoney said. "RPC TOOL doesn't address global naming, security and administration features, but it's a start."

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First CNO II user seeking service edge

continued from page 1

customers — office product wholesalers and large corporations — to place orders electronically. Customers use personal computers connected to Boise's mainframe computer in Chicago via leased lines to place orders, check prices, verify if products are in stock and view lists of alternate products.

Today, the net supports about 700 customers via 115 multidrop leased lines running at 9.6K bit/sec. It also supports electronic invoice distribution from the Chicago mainframe to 31 distribution centers. According John Jazwiec, network systems and service manager at Boise, the network is operational 18 hours a day and is being used by some wholesalers as many as six hours a day.

With another 3,000 users sending orders via dial-up links, Jazwiec said 70% to 75% of the company's orders are placed electronically.

Although the network has enabled Boise Cascade to meet customer demand, network response time has degraded as its usage increased. Some of the multidrop lines support as many as 25 customer sites.

Response time is critical in an industry notorious for low customer loyalty. The problem, explained Harder, is the same one grocery stores face: "You've got your favorite store and if you aren't able to get there, you stop somewhere else and you get pretty much the same product." The same is true for Boise. If customers cannot get through on the net to place an order, they'll go to a competitor. "A paper clip is a paper clip," Harder said.

Boise began searching for a network upgrade that could cut response time in half. It also hoped to increase network reliability by building in redundancy and to make the net more cost-efficient, Jazweic said. Eventually, the company turned to AT&T and CNO. Besides addressing the response time problem, working with a single vendor promised to alleviate the difficulties the firm had managing multiple leased lines from a number of carriers.

The AT&T/CNO network will include backbone nodes — AT&T Datakit II virtual circuit switches — located at AT&T points of presence in Salt Lake City, Atlanta, Cleveland and Chicago and linked with four T-1s. A fifth redundant T-1 line will link Chicago and Atlanta.

The Datakit II switches will handle multiplexing, protocol conversion and reconfiguration of the network if any T-1s fail.

Customers supported by 9.6K bit/sec leased lines will be linked to the backbone regional hubs. This arrangement reduces the maximum number of drops per line from 25 to eight and improves response time.

Harder said the opportunity to collocate network equipment at AT&T sites was the true selling point. Since AT&T staff will maintain the equipment at the nodes, Boise will not have to assemble four new teams of telecommunications staffers to man the node locations.

This would have made the network upgrade prohibitively expensive, Harder said. The current network upgrade is expected to pay for itself in three years.

DCA may spin off wide-area net group

continued from page 8

Digital Transmission Systems, Inc., a T-3 digital access and cross-connect system (DACS) maker DCA bought in December 1988. Without the charge, DCA earned $30.3 million, off from the $42.2 million earnings reported for the fiscal year ended June 30, 1988.

Analysts praised the announcement, saying the Network Communications Group has not been contributing much to DCA earnings.

The announcement also quells rumors that both DCA groups will be sold, analysts said. "It becomes quite clear that no one is going to buy out DCA," Pafumi said.

Rumors have circulated that Motorola, Inc. and, most recently, Racal-Milgo, which already resells DCA's System 9000 T-1 multiplexer under an OEM agreement, were interested in buying DCA, analysts said.

In addition to the System 9000, which DCA acquired when it bought Cohesive Network Corp., the Network Communications Group sells the Series 300 statistical multiplexer family, Network Management System software and a T-3 DACS product acquired when it bought Digital Transmission Systems.

DCA's Personal Computer Communications Group includes the company's flagship Irma microcomputer-to-mainframe product family; MacIrma boards that link Apple Computer, Inc. Macintoshes to mainframes; Irmalan and LAN Manager Select local net-to-mainframe gateway software; 10NET Communications local network software and hardware; and Crosstalk communications software.

"DCA originally bought the wide-area network business to enhance their local network business so they could provide a total solution," Pafumi said. But DCA's plans to build products that integrate its local- and wide-area net equipment have not borne much fruit, he said.

Analysts agreed keeping the two groups under one corporate banner makes little sense. "There is no reason for the two to be together," said Richard Kimball, an analyst with Montgomery Securities in San Francisco. "The T-1 business is probably worth more as a stand-alone company."

Keeping the two groups together only confuses users about whether DCA is more committed to personal computer products or wide-area networking, said George Chow, president of Milpitas, Calif.-based Able Telecommunications, Inc.

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GM commits to MAP 3.0 for new facility

continued from page 2

spire confidence in the manufacturing community.

Instead, attendance at the MAP/TOP Users Group's thrice-yearly meetings dropped off, and some industry observers began to wonder whether MAP/TOP was dying.

The Toronto meeting seemed to dispel that notion, showing instead a renewed interest in MAP/TOP networking. "We finally have a good turnout again," said one conference official.

However, while the attendance totals were reassuring, vendors outnumbered users by a wide margin, and the majority of users seemed to be spectators.

Gary Blunck, a member of the technical services staff of Deere & Co., said his firm recently selected a proprietary network over MAP and was planning to implement it throughout the corporation.

The MAP vendors were not responsive to the concerns of Deere's management. "It's a real lost opportunity for MAP," Blunck said. "There is a tremendous need for education" about the state of MAP.

Companies beneath the Fortune 500 tier are also taking a cautious approach to MAP.

Steelcase, Inc., a $2 billion manufacturer in Grand Rapids, Mich., has been tracking MAP developments closely for several years but hasn't implemented it yet. "We're going to take a good hard look at [the Manufacturing Message Specification] and see how it fits into our long-term strategy," said Ron Gibb, an information systems analyst for the company.

MMS is the language that cell controllers on a MAP network use to direct the activities of factory-floor devices. The version of MMS in MAP 3.0 is better than, but incompatible with, the version in MAP 2.X. The abandonment of such a key piece of MAP did not inspire confidence in prospective buyers.

HP sought to dispel some MAP fears by staging an interoperability demonstration at the MAP/TOP meeting involving products from nine vendors: Allen-Bradley Co., Computrol, Inc., Concord Communications, Inc., GE FANUC, Intel Corp., Motorola, Inc., Retix and Sisco, Inc.

"The significance of this demonstration is that these are all released products," said Rona Prufer, a member of HP's technical staff.

"We plugged them in, and they worked. We just had to change some configuration parameters," Prufer said.

> "There is a tremendous need for education" about the state of MAP, said Deere & Co.'s Gary Blunck.
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Bank group gives AT&T the business

continued from page 1

with three other vendors who have agreed to offer ABA members discounts of up to 50% on telecommunications equipment and office products:

- Lanier Worldwide, Inc. will offer equipment such as facsimile machines, electronic key telephones and voice mail systems.
- Ohio Bell Communications, Inc., a subsidiary of Ameritech Information Systems, will sell private branch exchanges, service contracts and systems integration services.
- Haworth Corp. will offer modular office furniture.

The consortium is also talking to AT&T about selling its telecommunications equipment to consortium members at a discount.

Although the benefit of volume discounts is obvious, officials of the group stressed that they will offer users value-added packages. At no additional charge, Financial Communications Exchange will provide network analysis and optimization services, and it will staff a help desk for users to call with problems about services or products.

William Petrarca, president of Financial Communications Exchange, said the program will be particularly attractive to small and midsize banks that do not have enough volume to leverage large discounts or enough internal staff to manage communications services.

"Today, only the largest banks in the country can negotiate those kinds of savings. This program allows a $20 million bank to get the same kinds of savings and have at their disposal the expertise and staff of [Financial Communications Exchange]," Petrarca said.

He added that several large banks with assets over $20 billion have even expressed interest in the program, primarily because of the help desk and consulting services.

"We will have a help desk anybody can call to resolve, in one phone call, what would normally take a lot of phone calls if done vendor by vendor," Petrarca said. He estimates that between 3,000 and 5,000 banks will join the consortium within three years.

According to Donald Shoemaker, president and chief executive officer of Progressive Communications Technologies, Inc., one of the parent companies of Financial Communications Exchange, banks have "a lot on their plates and not enough resources." The consortium will make it possible to off-load some of the responsibilities of managing a telecommunications system.

Bank officials "want to run their business," Shoemaker said. "They don't have the staff and expertise to [manage the network]. Deregulation has made this far more complex."

To purchase products and services through the consortium, banks must either be a member of ABA or of a state banker's association. The banks will be charged an annual membership fee based on which group they belong to and on their asset value.

> "Today, only the largest banks in the country can negotiate those kinds of savings," Petrarca said.
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For example, banks with assets of less than $100 million will pay $1,625 if they are members of ABA but $2,150 if they belong to a state group. Banks at the top end of the range, with assets above $2.5 billion, will pay $67,500 if they are ABA members and $90,000 if they belong to a state group.

ABA members buying through the consortium are guaranteed that they will annually save at least twice the membership fee, or their money will be refunded. Members of state associations are guaranteed they will save at least 1½ times their fee.

Members who are not satisfied with the consortium's program after six months can get a full refund.

Merrill Lynch to farm out net management

continued from page 2

ating system) IBM RT Personal Computer which will act as a front end to an IBM Personal System/2 microcomputer running NetView/PC.

The IBM RT Personal Computer and Personal System/2 will be located in the network control center at Merrill Lynch and linked on an IBM Token-Ring Network. According to James Boyle, vice-president of network operations for IBM's National Service Division, the IBM RT Personal Computer will run custom software designed to improve the efficiency of NetView/PC by filtering certain alarms and doing some data formatting.

NetView/PC will forward alarms to and receive commands from NetView software running on an IBM mainframe on IBM premises. The mainframe will probably be located in Raleigh, but could be located at another IBM location linked to the Raleigh control center via IBM's internal network, Boyle said.

The mainframe will be tied to the Merrill Lynch site via two 56K bit/sec dedicated circuits, said George Simons, director of operations support for MCI.

The seven network management systems to be integrated into NetView include an MCI Integrated Network Management Services product which enables employees to gather alarms and performance data about a MCI virtual network services, and management products for the company's Network Equipment Technologies, Inc. T-1 multiplexers and Racal-Milgo modems.

Network engineers at both net control centers will have Personal System/2s linked on a Token-Ring they can use to view alarms gathered by the NetView host and issue management commands.

A mirror-image backup control center for the IBM site will be maintained on IBM premises in Atlanta.

About 20 Merrill Lynch personnel will be stationed at the network control center at the brokerage firm's premises to monitor and control day-to-day operations carried out by the vendors.

Peterson said that by farming out network management operations, Merrill Lynch will be able to take advantage of technologies and expertise the vendors have at their disposal.

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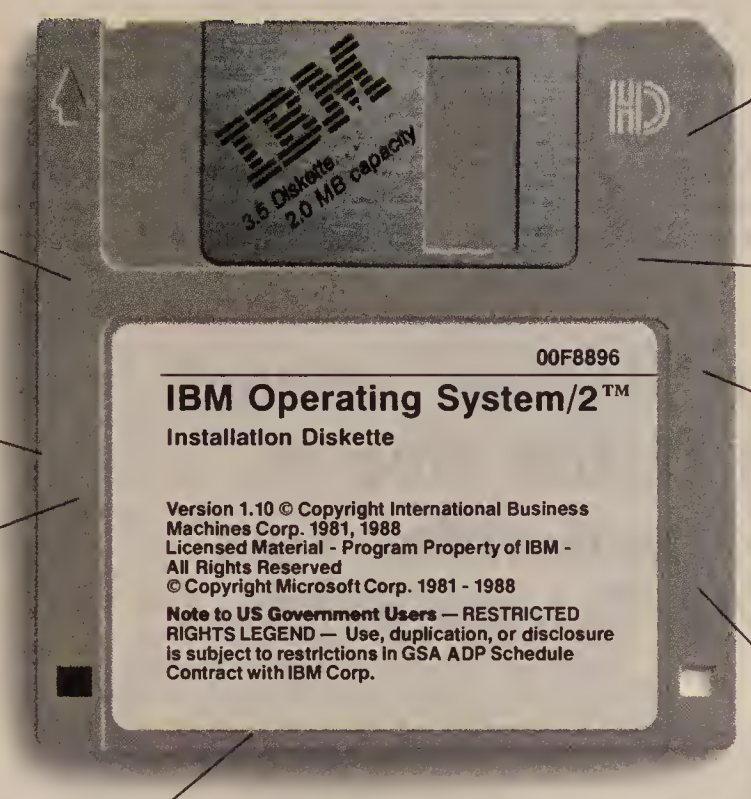

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IBM, hospital to study applications

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vanced communications capabilities to physicians' offices.

Development of applications will be supported by an IBM 9751 private branch exchange that was installed at St. Joseph's in April. The switch, which supports 3,500 stations and 250 trunks, replaced an AT&T Dimension PBX.

The IBM PBX handles some data switching for the 650-bed facility; it supports a modem pool for external communications at up to 2,400 bit/sec. Stand-alone personal computers within the facility also communicate with one another through the switch at speeds up to 19.2K bit/sec.

The facility operates a fiber-optic IBM Token-Ring backbone network that provides access to two IBM 4381 mainframes. One of the mainframes runs IBM's Professional Office System, while the other runs an application that manages patient information such as admission and discharge dates, transfers and lab results, as well as demographics.

The backbone connects five IBM 3174 cluster controllers dispersed throughout the eight-building campus. Each cluster controller supports between 32 and 46 terminals and printers. Also directly attached to the Token-Ring are a variety of workstations running 3270 terminal-emulation software. In attempting to identify applications for the health care field, IBM and St. Joseph's are studying current hospital procedures and will identify how those procedures could be enhanced.

Local net downtime costs users a bundle

continued from page 1

down or experiences repeated outages, business will definitely suffer," he said.

Infonetics surveyed 100 Fortune 500 users, each with annual revenue in excess of $1 billion, on the number of local network failures and their associated costs in lost productivity and revenue. The consulting firm then polled users on the number, frequency and extent of their local network outages.

The study, which was commissioned by Network General Corp., a San Jose, Calif.-based manufacturer of local network protocol analyzers, revealed that users experience an average of 24 local net failures yearly — roughly two a month. Network problems knocked out at least a portion of users' local nets for an estimated 10 hours per month, Spanier said.

Roughly 45% of the users interviewed said they experienced from 10 to 100 local network disabilities over the span of a year; 5% indicated they had in excess of 100 network failures. The remaining 50% of the respondents said they had fewer than 10 network outages annually; 12% said they had either no network disabilities or just one, Spanier added.

The survey showed that the average outage lasted five hours.

Infonetics did not ask users to cite the specific causes of their local network disabilities.

Spanier said the average cost to users in lost productivity was $3.5 million a year, a figure determined by calculating the number and length of outages, and the number of local network users affected.

But some users racked up much higher productivity losses, he said. The highest productivity loss reported by one user was a whopping $138 million in a single year. (The names of responding companies were not released by Infonetics.)

Infonetics also assessed revenue losses incurred because of local network downtime. While the average annual revenue loss was $600,000, one user reported a loss of $27 million for the year.

Spanier said some of the companies that suffered the highest productivity losses from network disabilities had comparatively low revenue losses. "In those cases, the networks weren't used for mission-critical applications such as stock or financial transactions, or airline reservations," he said.

Roughly 45% of the users said they experienced from 10 to 100 local net disabilities over the span of a year.

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Conversely, some of the smaller companies surveyed experienced severe business losses when their networks were disabled. "These were companies that had relatively small networks — under 100 nodes — and sustained few network disabilities. But when they did experience a network failure, it was extremely damaging to their business," Spanier said.

While the Infonetics survey indicates that local network downtime is costly, Spanier said users devote relatively few resources to maintenance. The average user spends about $60,000 annually, a figure that includes salaries for network personnel as well as network service and support contracts.

In response to Infonetics' survey, Dwayne Cartier, senior engineer in Control Data Corp.'s computer manufacturing information systems control group in St. Paul, Minn., said his company experienced only minimal downtime. Nonetheless, Cartier said that outages are a fact of networking life, noting that even when a user takes precautions, it can still fall prey to inexplicable network disabilities.

"We've had sporadic cabling problems that caused users to experience 30-second delays in trying to perform a function," Cartier said. "[But] we simply haven't been able to track down the source."

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Unforeseen problems that can put the bite on your network

STP — the phone company's edge

BY JAMES CARLINI

Last year, when a major manufacturing company in Illinois decided to install a new telephone system at one of its facilities in an industrial park, the firm's corporate telecommunications manager thought the task would be easy. All he had to do was place the order for the number of trunks needed from the central office for the private branch exchange, have them connected, and the system would be up and running.

However, things didn't go quite as smoothly as expected. As the installation of the switch began, the network manager noticed the lack of sufficient telephone cable coming into the facility. He immediately called the telephone company only to be told that it would take six months to lay a new cable. Only after some heated discussions and well-placed calls to upper management did the manager get the time frame shortened to four weeks — and he counted himself lucky to have done so.

How much cable do you have coming into your building? Of that total, how much is working pair, nonworking pair and spare pair? If you don't know this vital information, you could be sitting on a disaster waiting to happen.

Sorry, that's proprietary

Cabling and wiring problems are going to be the icebergs of telecommunications in the 1990s. You will be aware of only 5% of the problems, which are on the surface, while the other 95% will be hidden by the telephone companies and their proprietary information classifications. And should you try to obtain information, you're likely to be hit with the "STP" line.

STP? That stands for "Sorry, that's proprietary." If you can't get an answer to a cable inquiry or other type of service question, chances are your telephone company is using the STP line on you.

In some states such as Illinois, local exchange companies have already transferred responsibilities for inside wiring to property owners. However, they did so without completely thinking through their policies on information privileges that become essential for the new owners.

For example, in a recent project involving Illinois Bell Telephone Co., a building owner wanted to find out the cabling capacity entering his facility. At first, Illinois Bell hid behind its STP line. However, the carrier then changed its tune. It could not find any reason to keep that information proprietary, especially after learning that US West, Inc. and Pacific Telesis Group provided the same information for a similar project that had been undertaken three years before. Examples of companies that have suffered from not knowing the cabling capacity of their facilities are myriad. Take the case of a property management company in Arizona that could lease only 80% of one of its buildings because the cabling from the central office ran out.

When this scenario was related to an executive at a regional Bell holding company, he quickly responded that it must have been a "very isolated incident." He also stated that his company would respond "immediately" if there was not enough cable to provide service to a building.

And yet the frequency of these "very isolated" incidents is probably much greater than the local exchange companies would have you believe.

End users are sometimes given no information or false information on the proprietary nature of different telephone company data.

Carlini is president of Carlini & Associates, Inc., a management consulting firm in Hinsdale, Ill. He lectures on information technology and telecommunications at Northwestern University in Evanston, Ill., and is author of the upcoming book, Business Networks: Transforming Organizational Titanics into Starships.

How do these cable shortages happen anyway? Like Robin Hood, the phone companies often rob from the cable-rich and give to the cable-poor. For example, say your company occupies a building with 4,000 pair assigned to it, of which 2,700 are in use. Then a new building is constructed next to yours. Rather than running a new cable to it, the phone company takes 1,200 unused pair from your company's building and splices it to the new building. If the 100 unused pair your company has left is inoperable, your firm now has no spare capacity. Then when your telecommunications manager asks the phone company how this happened, he's told, "Sorry, that's proprietary." In the event of an emergency, your company must wait until the phone company can get a cable out to your building on *their* schedule and time frame — not yours.

Secret cable routes

Cabling capacity is not the only area in which users may encounter the STP line. The vice-president of MIS at a major Midwestern bank ran into it when he was involved in a networking project to connect several sites. This task required information on the routing of cable from his buildings to the local exchange company's central office — information the local exchange company did not want to provide for security reasons.

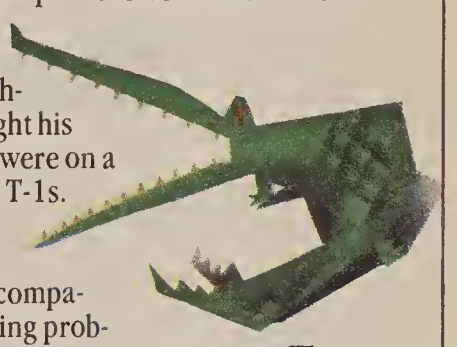
While it is reasonable for a phone company to want to keep the design of its network secret to maintain security, certain information that is critical in designing private networks can be obtained only from the local carrier. The Hinsdale disaster would not have nad as large an impact if customers had known that all of their traffic was being routed through one central office.

What can be done?

Routing diversification for user networks should be a given, not a bargaining chip. If your company is a big Centrex user, it has clout and can sometimes bargain for some extra redundancy or cable diversity by threatening to switch from Centrex to a PBX.

Alternate feeds to a second central office should be a standard operating procedure for major buildings, not a custom engineering job. These are issues that can be resolved if users get together and demand a review of proprietary policies and get a dialogue going with the phone companies' marketing and engineering people.

As the bank vice-president puts it, "If you don't ask for the information, the phone company does not volunteer it." Questions such as "Are these T-1 circuits on one route, or are they diversified?" are legitimate. Yet the questioner is often treated as if he is trying to get a complete map of the central office's network topology. Don't settle for the STP line; ask the local exchange company to show proof that you are being provided with routing diversification. Otherwise, you may wind up like another user who thought his T-1 lines were on different routes, when in fact they were on a multiplexed circuit. When the cable went, so did his T-1s.



Could the local exchange companies provide more information to users to make their communications decisions easier? Are the local exchange companies' statements about the infrequency of these cabling problems believable? Are there more of these stories? Sorry, that's proprietary.

IT'S HARD TO DRAIN THE SWAMP when those reptiles keep getting in the way. If you have a network "alligator story" to share with *Network World* readers, call Steve Moore, features editor, at (508) 820-2543, ext. 732, or fax your idea to (508) 879-3167.

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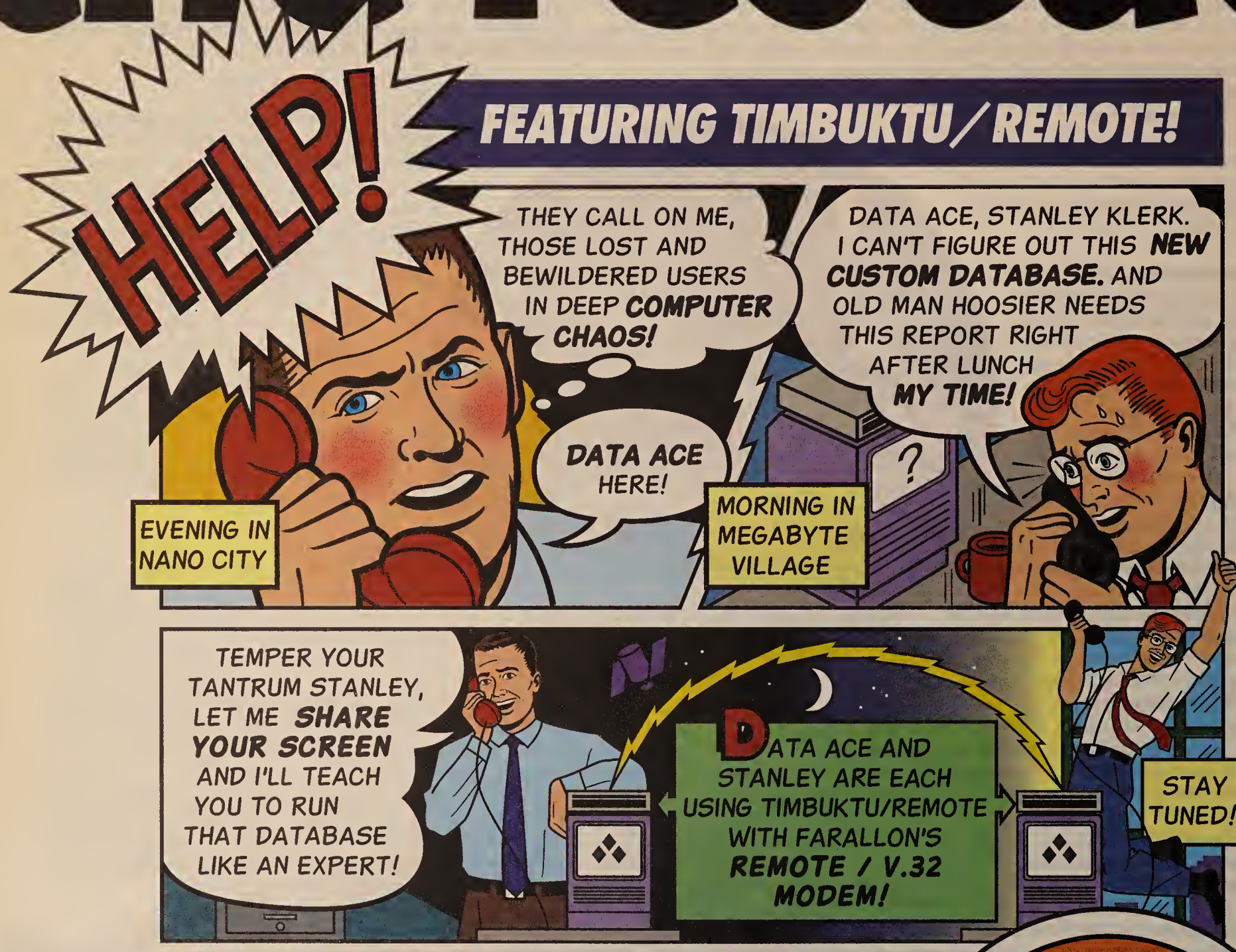

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